



Arlington Conservation Commission

Date: Thursday, October 1, 2020
Time: 7:30 PM
Location: Conducted by Remote Participation

Agenda

1. Administrative

- a. In accordance with the Governor's Order Suspending Certain Provisions of the Open Meeting Law, G. L. c. 30A, § 20 relating to the COVID-19 emergency, the October 1, 2020 public meeting of the Arlington Conservation Commission shall be physically closed to the public to avoid group congregation. The meeting shall instead be held virtually using Zoom.

Topic: Conservation Commission Meeting

Time: October 1, 2020 07:30 PM Eastern Time (US and Canada)

Register in advance for this meeting:

<https://town-arlington-ma-us.zoom.us/meeting/register/tJEoc-CvrjsiHNDk4Yvk2RgDOft5cvS8k36W>

Members of the public are strongly encouraged to send written comment regarding any of the hearings listed below to Conservation Agent Emily Sullivan at esullivan@town.arlington.ma.us.

Please read Governor Baker's Executive Order Suspending Certain Provision of Open Meeting Law for more information regarding virtual public hearings and meetings: <https://www.mass.gov/doc/open-meeting-law-order-march-12-2020/download>

- b. Review draft 09/17/2020 minutes.

2. Hearings

Request for Determination of Applicability

Request for Determination of Applicability: 1165R Massachusetts Avenue
Arlington File # A20.4

This RDA was initially presented to the Commission at its 09/03/2020 meeting, and was continued to the Commission's 09/17/2020 and 10/01/2020 meetings. The RDA requests that the Commission review the jurisdiction of various resource areas within the boundaries of 1165R Mass Ave. The following three reviews are requested:

7:45pm

- 1) Review the Riverfront area to determine if the property contains a Historic Mill Complex as defined under the Massachusetts Wetlands Protection Act (WPA) Regulations 310 CMR 10.04.
- 2) Review the Historic Mill Complex exemption request under the Riverfront regulations in accordance with 310 CMR 10.58(6)(k).

3) Review the existing drainage ditch, known locally as Ryder Brook, and determine if it meets the definition of “stream” according to 310 CMR 10.04.

Notice of Intent

Notice of Intent: Wellington Park, 35 Grove Street

MassDEP File #091-0324

8:15pm This NOI was initially presented to the Conservation Commission at its 09/17/2020 meeting. This project proposes additional amenities in Wellington Park, including more native plantings, an extended pathway, a bioretention basin, additional signage and seating, and an informal exploration area. These additional amenities are located within the 100-ft Wetlands Buffer, Adjacent Upland Resource Area, and 200-ft Riverfront Area, and Floodplain of Mill Brook.

Request for Determination of Applicability

Request for Determination of Applicability: 26 Lakeview Street

Arlington File #A20.5

8:45pm This project proposes an addition located within the 100-ft Wetlands Buffer and Adjacent Upland Resource Area of Spy Pond.

Working Session

Thorndike Place Proposal

9:00pm The Conservation Commission will meet with the Applicant’s Engineer (BSC Group) and the Town’s Third-Party Reviewer (BETA) to review application materials related to wetland resources and stormwater in advance of the Zoning Board of Appeals’s 10/13/2020 hearing.



Town of Arlington, Massachusetts

Review draft 09/17/2020 minutes

Summary:

Review draft 09/17/2020 minutes.

ATTACHMENTS:

Type	File Name	Description
▢ Minutes	09172020_Minutes_Conservation_Commission.pdf	09172020 Draft Minutes



Arlington Conservation Commission

Date: September 17, 2020

Time: 7:30pm

Location: Conducted through Remote Participation using Zoom

Minutes

Attendance: Commission Members Susan Chapnick (Chair), Pam Heidell, Dave Kaplan, Chuck Tirone (Vice Chair), and David White; Associate Commissioners Cathy Garnett, Mike Gildesgame, and Doug Kilgour; and Conservation Agent Emily Sullivan. Members of the public included Susan Ann Kehler, Mary O'Connor, Dan Wells, Daniel St.Clair, Justin Wiley, Duke Bitsko, Andrew Keel, and Greg Hochmuth. Commissioner Nathaniel Stevens was absent.

08/20/2020 Meeting Minutes

The Commission discussed edits to the draft 08/20/2020 minutes. P. Heidell motioned to approve the minutes as edited, D. White seconded, all were in favor, motion approved.

09/03/2020 Meeting Minutes

The Commission discussed edits to the draft 09/03/2020 minutes. D. White motioned to approve the minutes as edited, P. Heidell seconded, all were in favor, motion approved.

Reimbursement Approval – Mt Gilboa Scout Project

The Commission reviewed the reimbursement request made by Henri Schuette for \$169.19 for his Scout project in Mt Gilboa which included trail restoration along two trails. D. White motioned to approve the reimbursement request using funds from the Conservation Stewardship Fund managed by the Arlington Land Trust, D. Kaplan seconded, all were in favor, motion approved.

D. White stated he would work with the Arlington Land Trust to issue the reimbursement.

Arlington Reservoir Master Plan Site Visit

S. Chapnick, C. Garnett, and M. Gildesgame summarized the site visit they had with the Reservoir Phase II designers and members of the Arlington Park and Recreation Commission, Arlington Recreation Director, and Lexington Conservation Director. The purpose of the site visit was to review the various components of the project prior to permit submittal, including: parking lot renovation, boat ramp construction, playground renovation and relocation, pathway construction through the bathing beach, renovation of the entry plaza, construction of a picnic pavilion, renovation of the perimeter path,

stabilization of the shoreline, and removal of invasive species and installation of native species along the perimeter path.

D. White commended the Park and Recreation Commission on their thorough public engagement process for this project.

D. Kaplan stated that the permit submittal should include winter maintenance for the porous parking lot.

Request for Determination of Applicability: 1165R Massachusetts Avenue

Documents Reviewed:

- 1) *1165R Mass Ave RDA*
- 2) *Letter from Town Counsel regarding Historic Mill Complexes Exemption*

Resource Areas:

- 1) *Mill Brook*
- 2) *100-ft Wetlands Buffer*
- 3) *200-ft Riverfront Area*
- 4) *Floodplain*

This RDA requested that the Commission review the jurisdiction of various resource areas under the Wetlands Protect Act only, within the boundaries of 1165R Mass Ave, also commonly referred to as Mirak 40B. The following three reviews are requested:

- Review the Riverfront Area to determine if the property contains a Historic Mill Complex as defined under the Massachusetts Wetlands Protection Act (WPA) Regulations 310 CMR 10.04.
- Review the Historic Mill Complex exemption request under the Riverfront Area regulations in 310 CMR 10.58(6)(k).
- Review the existing drainage ditch, known locally as Ryder Brook, and determine if it meets the definition of “stream” in 310 CMR 10.04.

This hearing was a continuation hearing from the initial hearing for this RDA at the Commission’s 09/03/2020 meeting.

The Applicant’s consultant, D. Wells stated that the purpose of the RDA was to understand the full extent of jurisdiction to inform the future NOI filing under the Wetlands Protection Act (WPA). D. Wells presented supplemental materials to the Commission that had been requested at the 09/03/2020 meeting, including: more information about the Historic Mill Complexes exemption, more historic information about the site, and additional investigation of potential resource areas upstream of Ryder Brook.

P. Heidell, S. Chapnick, and C. Tirone asked for clarification on the proposed northern boundary of the Historic Mill Complex, in the area of the current site’s parking lot. D. Wells stated that the northern boundary area was used as a driveway and has utility lines running through it. D. Wells referenced the 1945 recorded plan of the site, and stated that although there were substantial changes to the site between the 1920s and

1940s, the 1945 plan shows that this area was driveway. D. Kaplan recommended that the proposed northern boundary should be delineated conservatively because there is some ambiguity regarding the use of that area (e.g. driveway, parking, access). P. Heidell agreed that the northern boundary should be conservative and follow the old property line indicated on the 1945 plan, and that the project should include as much greenspace as possible. M. O'Connor affirmed there would be a significant increase in green space.

S. Chapnick asked the Commission whether it was ready to make a determination on the Historic Mill Complex Exemption. P. Heidell motioned that: 1) the property qualifies as a Historic Mill Complex and is exempt from the WPA's Riverfront Standards, and 2) the extent of the Historic Mill Complex is as described and amended during this meeting, of which the Applicant will provide an updated delineation. All were in favor, motion approved.

D. Wells presented his additional investigation of potential resource areas upstream of Ryder Brook. D. Wells affirmed that there are no resource areas upstream of Ryder Brook.

C. Garnett stated that she lives in that area of town and can affirm that there are no resource areas upstream of Ryder Brook.

C. Tirone stated that he conducted a similar investigation as D. Wells and witnessed the same conditions documented in his report.

D. Wells summarized that stormwater infrastructure drains to Ryder Brook, and so Ryder Brook is a drainage ditch and not a resource area under the WPA.

D. Kaplan questioned this interpretation of WPA jurisdiction, and stated that he interpreted the regulations such that since there is standing water in Ryder Brook near the bikeway and it was once a historic stream, that Ryder Brook is jurisdictional under the WPA.

D. Wells stated that since there is no longer a stream there, it is not jurisdictional under the WPA because jurisdiction is determined by present day conditions and not historic conditions.

D. Kaplan stated that since Ryder Brook flows into Mill Brook, the tributary serves ecological purposes that should be protected.

M. Gildesgame stated that the Commission's 09/02/2020 site visit did not observe any wetland characteristics along Ryder Brook, including soil type and prevalent vegetation.

C. Garnett stated that the Commission has no indication that there is connectivity between Ryder Brook and an upstream bog, there is not bog upstream.

D. Kaplan asked whether the standing water by the bikeway can be considered the source of the stream. C. Garnett stated that there is no hydrologic connection between the standing water and Ryder Brook, and that it is merely overland flow and not a stream.

C. Tirone stated that the WPA's definition of stream includes above or below ground.

D. Wells stated that the current USGS Stream Stats and map do not show a stream upstream of Ryder Brook. Additionally, the Stream Stats show that the watershed area of Ryder Brook is below the area requirement for streams under WPA jurisdiction. D. Wells stated that Ryder Brook is an intermittent stream, and that since it is not connected to any upstream wetland area it is not jurisdiction under the WPA.

S. Chapnick stated that she thought Ryder Brook was a drainage ditch that although is jurisdiction under the Arlington Bylaw for Wetlands Protection, is not jurisdictional under the WPA.

P. Heidell motioned that Ryder Brook is not jurisdiction under the WPA, S. Chapnick seconded, the motion did not pass (P. Heidell voted to approve, S. Chapnick voted to approve, C. Tirone voted to deny, D. White voted to abstain, and D. Kaplan voted to abstain), the motion was not approved.

The Commission requested the following information regarding Ryder Brook:

1. The definition of stream under WPA
2. Clarification of how connections to and from resource areas to Ryder Brook impact its jurisdiction
3. Case law precedence for the Applicant's assertion that Ryder Brook is not jurisdictional

C. Tirone motioned to continue the hearing to the Commission's 10/01/2020 meeting, D. Kaplan seconded, all were in favor, motion approved.

Request for Certificate of Compliance: 12 Clyde Terrace

MassDEP File #091-0274

Documents Reviewed:

- 1) *12 Clyde Terrace NOI*
- 2) *12 Clyde Terrace OOC*
- 3) *12 Clyde Terrace Amended Planting Plan*
- 4) *12 Clyde Terrace Request for Certificate of Compliance*
- 5) *COC Internal Checklist*

Resource Areas:

- 1) *100-ft Wetlands Buffer*
- 2) *Adjacent Upland Resource Area*

The project as approved proposed to raze an existing single family home and replace it with a single-family home in the 100-ft wetlands buffer and AURA of an isolated wetland. The project was approved on 06/19/2017.

G. Hochmuth reviewed the project history of the site, and summarized that the all conditions had been met except for the 3 year monitoring period plantings, which had been planted in 2019. G. Hochmuth shared photos of the site with the Commission, and stated that at least 80% of the vegetation and plugs have survived.

C. Garnett noted that the plug area also contains crab grass, which should be removed. G. Hochmuth agreed, and said he would tell the Applicant that the crab grass needs to be managed.

D. Kaplan motioned to issue a complete Certificate of Compliance with continuing conditions 38, 39, 43, 44, and 45, D. White seconded, all were in favor, motion approved.

Notice of Intent: Wellington Park

MassDEP File #091-0324

Documents Reviewed:

- 1) *Wellington Park NOI*

Resource Areas:

- 1) *100-ft Wetlands Buffer*
- 2) *Adjacent Upland Resource Area*
- 3) *Riverfront Area*
- 4) *Floodplain*

This project proposes additional amenities in Wellington Park, including more native plantings, an extended pathway, a bioretention basin, additional signage and seating, and an informal exploration area.

D. Bitsko and A. Keel presented the project history and project proposal. Project components include extending the existing boardwalk through a porous pathway that connects to the existing bridge, an informal play and exploration area, additional benches and picnic tables, a bioretention basin near Prentiss Road, and substantial native plantings.

P. Heidell asked why the informal play and exploration area was proposed in the floodplain. D. Bitsko stated that it would add significant compensatory flood storage. The exploration area would require 40 cubic feet of fill, but remove 600 cubic feet of area, creating a net increase of 540 cubic feet of compensatory flood storage.

C. Garnett stated that she had attended multiple public meetings for the design of this project, and appreciated the resilient design. P. Heidell cautioned that an informal play area in the floodplain did not seem like a resilient design. D. Kaplan stated that if areas of the exploration area were in the floodway, it also did not seem like a resilient design.

C. Tirone asked if trees along Mill Brook bank were proposed for removal. D. Bitsko stated that no trees along the bank were proposed for removal, but three trees in the park, near the house on Grove Street were proposed for removal.

C. Tirone asked for clarification on the proposed bioretention basin, and its proposed materials.

C. Tirone asked if the proposed plantings would increase shade in the park. D. Bitsko stated that yes, proposed trees would increase shading in the park.

The Commission made the following requests and suggestions for the project:

- 1) send project to DPW for stormwater review
- 2) look for opportunities to reduce planting maintenance
- 3) review size of stone in bioretention basin and potential for two layers
- 4) review how the exploration area interacts with the floodplain/floodway
- 5) consider the winter maintenance of roads and impact on bioretention basin
- 6) determine if DPW has any future work planned for Prentiss Road

C. Tirone motioned to continue the hearing to the Commission's 10/01/2020 meeting, D. Kaplan seconded, all were in favor, motion approved.

Regulatory Update: Stormwater Management Section

The Commission reviewed and discussed Section 33: Stormwater Management for the Arlington Regulations for Wetlands Protection. Discussion of this regulatory update will continue to the Commission's 10/01/2020 meeting.

D. White motioned to close the Commission meeting, C. Tirone seconded, all were in favor, motioned approved.

Meeting adjourned at 10:40pm.



Town of Arlington, Massachusetts

Request for Determination of Applicability

Summary:

Request for Determination of Applicability: 1165R Massachusetts Avenue

Arlington File # A20.4

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7:45pm

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ATTACHMENTS:

Type	File Name	Description
Request for Determination of Applicability	1165R_Mass_Ave_Letter_re_Historic_Mill_Complex_09022020.pdf	1165R Mass Ave RDA Historic Mill Complex
Reference Material	Town_Counsel_Guidance_on_Historic_Mill_Complex.PDF	Town Counsel Guidance on Historic Mill Complexes 09032020
Request for Determination of Applicability	1165R_Mass_Ave_Supplemental_Materials_09102020.pdf	1165R Mass Ave RDA Supplemental Materials 09102020
Request for Determination of Applicability	1165R_Mass_Ave_RDA_Stream_Inspection_Letter.pdf	1165R Mass Ave RDA Ryder Brook Investigation
Request for Determination of Applicability	1165R_Mass_Ave_RDA_P_Worden_09142020.pdf	1165R Mass Ave RDA_P Worden Letter #1 0914202
Request for		1165R Mass Ave RDA_P

KRATTENMAKER O'CONNOR & INGBER P.C.

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TELEPHONE (617) 523-1010
FAX (617) 523-1009

September 2, 2020

CHARLES G. KRATTENMAKER, JR.
MARY WINSTANLEY O'CONNOR
KENNETH INGBER

OF COUNSEL: RAYMOND SAYEG

VIA EMAIL

Emily Sullivan
Conservation Agent
Arlington Conservation Commission
730 Massachusetts Avenue
Arlington, MA 02476

Re: 1165R Massachusetts Avenue, Arlington, MA

Dear Ms. Sullivan:

This letter is intended to provide additional information in response to your email of August 31, 2020 to Dan Wells at Goddard Consulting.

Enclosed are plans 1086 and 1088 of 1939, from December, 1939, which clearly show all three mill buildings constructed on land formerly owned by the Theodore Schwamb Co.. These plans also depict the parking field as well. Also enclosed is plan 860 of 1940 which, at the top half of the plan, evidences the fact that the Theodore Schwamb Co. owned everything south of the railroad tracks and east of Ryder Street.

1167R Massachusetts Avenue, which now houses WorkBar, formerly housed the Schwamb Piano Factory, where the company manufactured piano cases. As detailed in the attached article, in 1850, Charles and Jacob Schwamb moved the Dodge Mill to what is now 1167 Massachusetts Avenue to make piano cases. In 1853, Charles and Jacob were joined by Theodore, Peter and Frederick Schwamb, who operated a collaborative piano case business at 1165 Massachusetts Avenue. In 1928, Theodore's nephew purchased the company and discontinued the manufacture of piano casings and began to manufacture architectural woodwork. See the article by Grace Dingee and the photograph attached.

With respect to Lot 8D, a 2,950 square foot lot which is part of what is labeled "0 Ryder Street", directly abuts the Mill Brook and the rear mill building, incorrectly identified as 165R Massachusetts Avenue on Plan 110 of 2019, a copy of which is enclosed, the applicant would suggest to the Commission that it is indeed reasonable for the Commission to conclude that this area given its location was land clearly associated with the historic mill complex use.

It is the applicant's position that the parking fields and the access route to the west along Mill Brook is to be considered land within the historic mill complex which is exempt from the

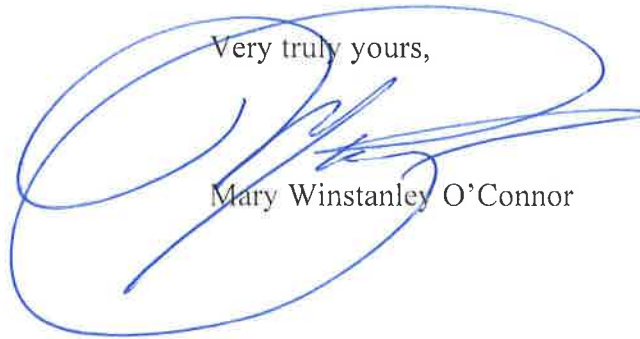
KRATTENMAKER O'CONNOR & INGBER P.C.

Emily Sullivan
September 2, 2020
Page 2

Riverfront Area since it is land clearly associated with the historic mill complex use. See Matter of 104 Stony Brook, LLC, OADR, Docket No. WET-2017-021, 12 (2018).

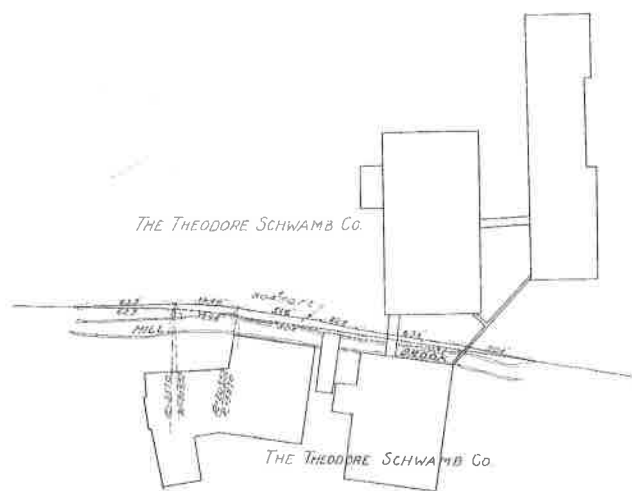
In the event you require any additional information, please do not hesitate to contact me or Dan Wells. I thank you.

Very truly yours,

A handwritten signature in blue ink, appearing to read 'Mary Winstanley O'Connor', is written over the typed name. The signature is stylized with large loops and a long horizontal stroke at the end.

Mary Winstanley O'Connor

MWO/ccg
Enclosures
6926



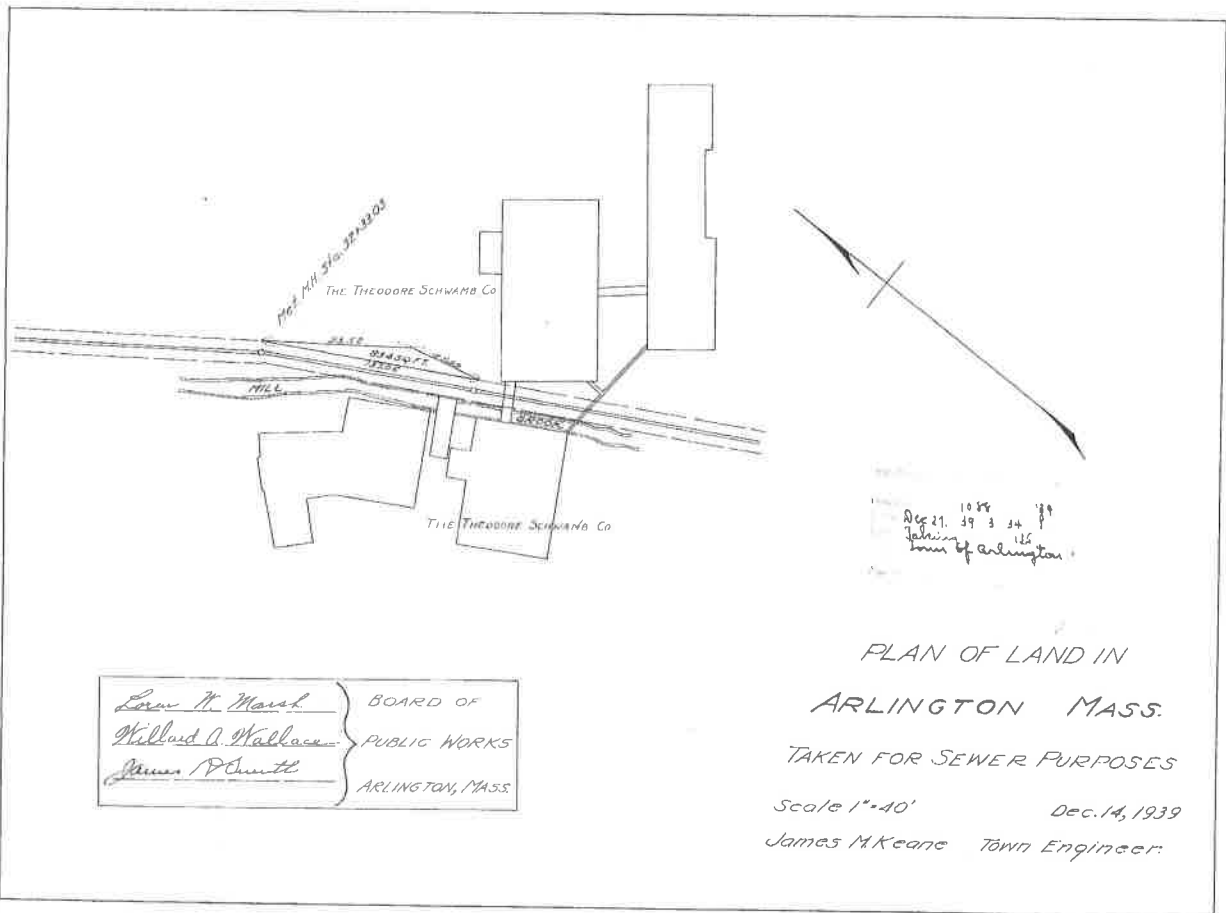
Dec 15 1939
 James M. Keane
 Town Engineer

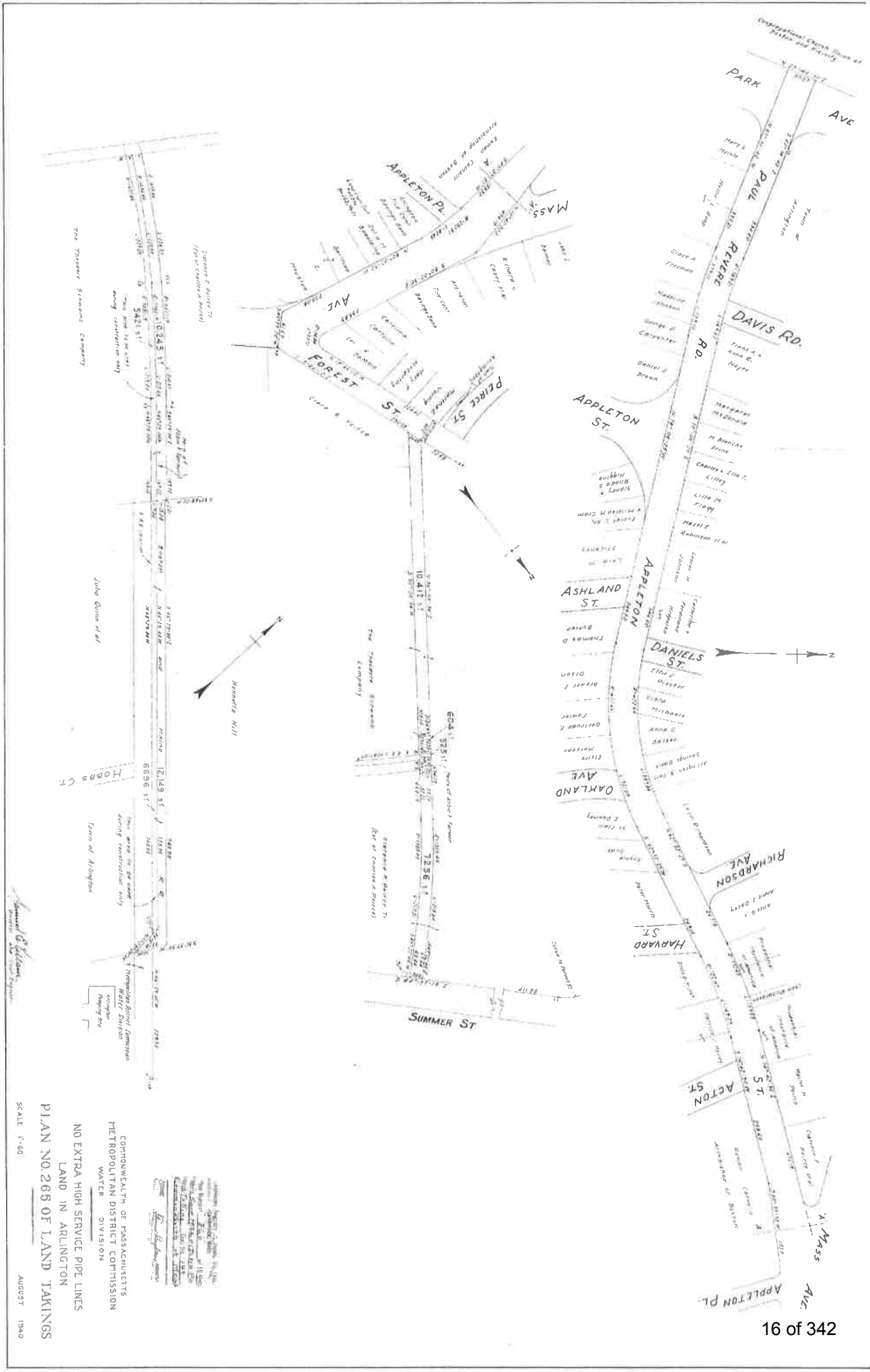
Louis A. Marsh Willard A. Wallace James P. Smith	BOARD OF PUBLIC WORKS ARLINGTON, MASS.
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PLAN OF LAND IN
 ARLINGTON MASS.

TAKEN FOR STORM DRAIN PURPOSES

Scale 1"=40' Dec. 15, 1939
 James M. Keane Town Engineer.





COMMONWEALTH OF MASSACHUSETTS
METROPOLITAN DISTRICT COMMISSION
WATER DIVISION

NO EXTRA HIGH SERVICE PIPE LINES
LAND IN ARLINGTON

PLAN NO. 265 OF LAND TAKINGS

SCALE 1"=60'

AUGUST 1940

even though they were threatened at times in the years when school divestment was the fashion, the premise being that the school-age population would continue to decline. In 1899 also, Peter Schwamb, a long-time member of the Arlington Water Commission, was, in the words of William Cutter, “instrumental in having the town admitted into the Metropolitan water system.” He remained active at Theodore Schwamb Company and joined in its incorporation as Treasurer in 1897.

After Theodore's death in 1909, Peter took early retirement from M.I.T. and worked even more closely with the company until his own retirement in 1924.

While Theodore Schwamb built his company slowly, Charles leapt ahead quickly. From 1864 to 1879, Theodore's expansion was slower than Charles's. In 1878, for instance, when the bulk of the Mill owners were awarded damages for the drastic curtailment of the waters of the Sucker Brook due to the excavation of the Heights Reservoir, Theodore received \$6,024.16. Charles Schwamb, on the other hand, still riding the crest of the vastly popular oval frame business, received \$11,587.58. In 1875, *The Arlington Advocate* noted that Charles Schwamb had acquired “a snug fortune” in his business. In October of that year, he organized a surprise party among his thirty-five mill workers to welcome his twenty-one-year-old son, Carl William, into his business as a partner. “The men in the establishment last Friday evening, despite the unfavorable state of the weather, marched in a body to the residence of Mr. Schwamb to congratulate the new firm.” The “residence” was an impressive new mansard-roof house, which Charles had recently constructed at what is now 22 Fessenden Street. What Carl William, an artistic young man, thought of joining a dusty business (it was apparent later that his lungs were delicate), is a good question.

But if he had to choose sawdust, rather than music, nevertheless, he remained a dutiful son and partner in the firm. He was the only son available at that time. When his only brother, Herbert Page, reached maturity 11 years later, he chose to go west to Denver. Within these limitations, Carl and his parents seemed to understand one another. He served as alternate organist, not only at the First Baptist Church where the family worshipped, but at various churches in the Heights and in Lexington. He was pianist for many years for the Sunday school of the First Baptist; and he designed music curriculum for the Arlington schools. Carl William died at the relatively early age, of 57 in 1912; yet for many decades thereafter a harpsichord stood on the third floor of the Mill as a reminder. In gratitude for Carl



In the middle : The Theodore Schwamb house as it looks today, without wrap-around porch. The photo shows the whole ensemble of historic buildings. Right to left: Former Theodore Schwamb Company Mill buildings, 1165-1167 Mass. Avenue (mid-19th/early 20th century) Theodore Schwamb house, 1171 Mass. Ave.; (c. 1845); and the Kimball Farmer house, 1173 Mass Ave. (c. 1828).

William's contributions to the First Baptist Church in Arlington Center, the parish gave him an intricately carved square piano, an instrument which has been lovingly restored in the family of his granddaughter, Dorothy Sweet Fornan, of Macomb, Illinois.

In 1879, the market for oval frames collapsed as square frames became the fashion. To the array of modern equipment Charles already had — rotary planers, band saws, circular saws and jigsaws, boring machines used for dowelling, and common and eccentric turning lathes — he now installed a molding machine, capable of being set to finish any possible design for straight stock, and to fashion any contour a frame maker might want. An enlarged second floor was added to accommodate the long lengths of stock. Charles was also helped with orders subcontracted from his brother, Jacob, who had for several years been operating in his own Mill at 1033 Mass. Avenue next to the building that is today Stop and Shop Pharmacy. (Not until 1919 did this parcel go out of Schwamb hands, when it was sold to a manufacturer of electric repair parts, and carbon and metal brushes used in automobiles.

The Advocate reported that “The building is of the olden time construction and the timbers are put together with wooden pins, heavy timbers being used and many of them, quite a contrast to the buildings of today”. In recent years, several nostalgic mill enthusiasts have looked for this treasure, only to leave again cursing the brick-cube apartment building which

has replaced it.)

In the early 1890s, America experienced a severe economic panic, followed by a prolonged recession. It is therefore surprising to read that the Theodore Schwamb Company saw constant growth, both in the 1890s and in the first years of the new century. In 1898, the year after its incorporation, the Company was the largest single business in Arlington. Directors were Peter Schwamb, Treasurer, Philip Eberhardt, Clerk and Assistant Superintendent, and Jacob Bitzer, Head of the shop. New property was purchased behind the Mill in 1905. In the same year, a narrow-gauge spur railroad track was added, linking the firm to the railroad and enabling the company to receive and deliver almost in the manner of a private railroad.

Among the new structures, the largest was the four-story brick building, which today still bears uppermost on its facade the words, THEODORE SCHWAMB CO., ready for the passers-by of the twenty-first century.

As the middle class began to upscale its musical tastes in the new century, the vogue for upright pianos gave way to the aspiration for a grand piano. Theodore Schwamb Co. followed the trend, which required not only skill but speed and coordination in gluing veneers to its fine hardwoods. As the new century dawned, however, the first generation seemed suddenly to have grown quite venerable. At Charles Schwamb and Son Co., the heir apparent, Carl William, was on a protracted stay in Denver to improve his health. At the Mill,

TEXT VERSION:

THEODORE SCHWAMB & THE ERA OF THE GERMAN MILLS IN ARLINGTON

By Grace Dingee, Mill Historian and Board Member

In 1838, Jacob Schwamb emigrated to Boston from Untenheim, Rhein Hessen, Germany. Jacob was the first of the Schwamb brothers to emigrate to the United States. By 1857, six of the seven Schwamb brothers had emigrated from Rhineland Pfalz to the United States.

In their heyday, nine separate mills, each with one or two backup mill ponds, dotted the Mill Brook Valley along Massachusetts Avenue from East Lexington as far as Mystic Street in Arlington. The water of the Mill Brook was used by each mill wheel in turn, and the water was then passed on to the next. After 1872 the mills were forced to gradually convert to steam when the Arlington Heights residential plan was laid out and the town dug a reservoir on Lowell Street, in anticipation of the professional class expected to populate the Heights. The influx was not realized because a prolonged recession cut demand and the Arlington Land Company went bankrupt within two years. Complaints were also lodged that the water was not clean. In 1898, Arlington applied to join the Metropolitan water system and in 1899, its petition was granted. Thus, the Heights were able to escape the fate of having the waters of the Great Meadows flow into their sinks.

None of this, however, reversed the draining down of the Great Meadows due to the reservoir. Gradually, the mill ponds lost their vital importance, were drained, filled in or left to grass over; and the great era of the mills was over. The last pond to go, Fowle's Pond near Mystic Street, was still visible in about 1955. Luckily, the town was able use the old mill areas for sports playing fields, particularly at the High School and at Buzzell field. Writing in 1924, Jacob Bitzer noted that, of the nine mills, only four were still running. Only two mills were prosperous enough to run full-time. These belonged to the frame maker and grandson of Charles Schwamb, Clinton W. Schwamb, and to the Theodore Schwamb Company, which at this time focused its business on wooden cases for grand pianos. Bucking the trend of the mills to shut down, these two would continue to work profitably for almost another 50 years, until 1969 and 1972, respectively.

When 17-year-old Karl Schwamb came from the southern Rheinland to apprentice at the sawing and wood-turning firm of Paul F. Dodge at 1175 Mass. Avenue, Yankee names dominated the town. There were Lockes, Winships, Robbinses and, above all, Cutters. The mill barns behind the Dodge house were known as the Stephen Cutter Mill, and the site of the new house built by Dodge came from the Cutter heirs. Similarly, if Karl had stayed in his hometown, Uнденheim, he would have belonged to an equally large clan of Schwambs. The Schwambs were as ubiquitous in Uнденheim as the Cutters were in Arlington. What both families shared was energy and a desire to have their own mills.

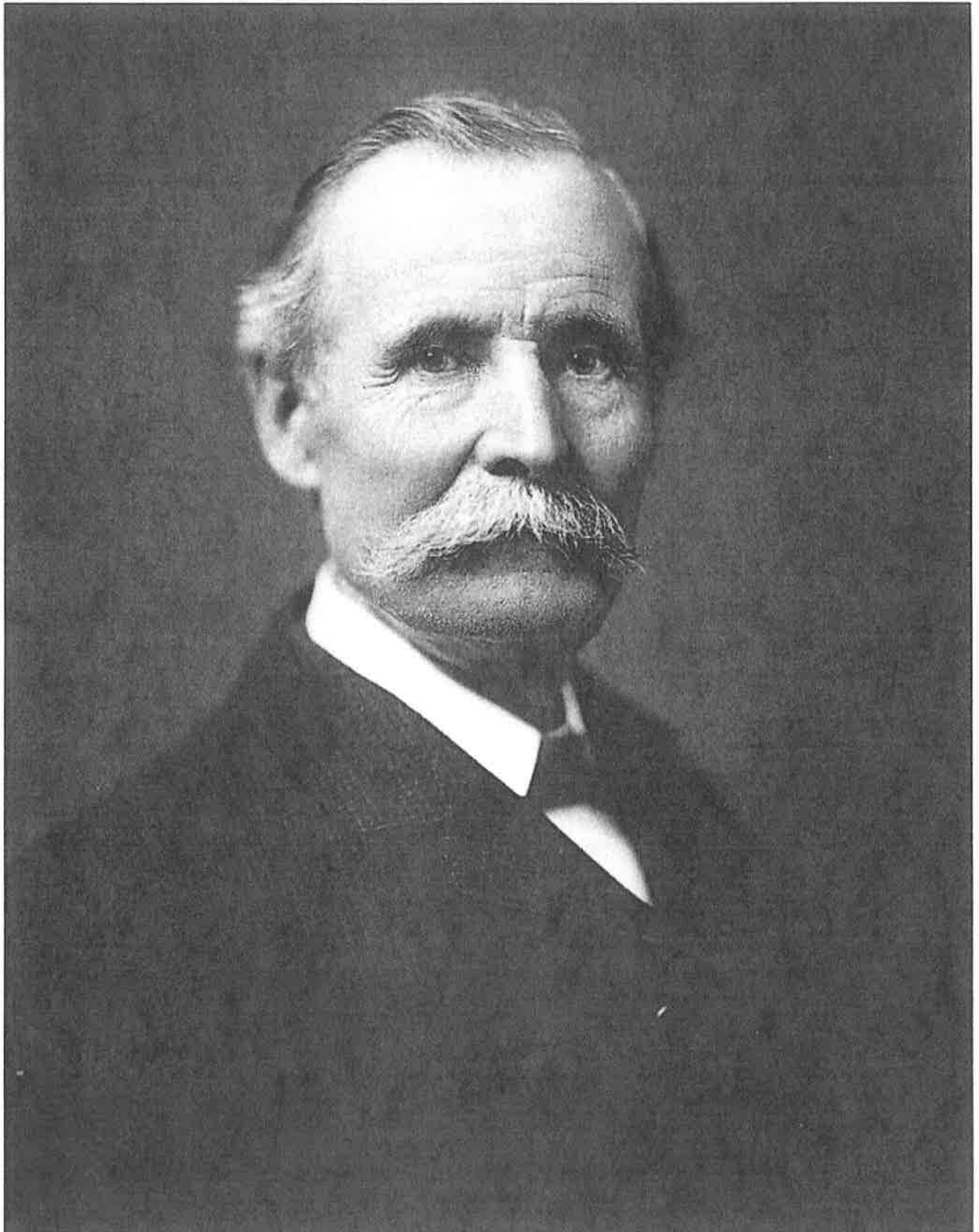
When he took on young Karl Schwamb as an apprentice, Dodge had suffered grievous personal losses: In 1836 he lost a son, age two months. In April, 1838, his wife, Maria Perry, died; and finally, his remaining infant son, age seven months, died in August of 1838. There is evidence that Dodge talked early to Charles about wanting to divest himself of the business. Half a century later, Karl Schwamb, renamed Charles Schwamb, consistently stated in his ads that his firm dated to 1850. This was likely the date when Dodge agreed to divestment. We know that the five Schwamb brothers' collaborative firm at this location began only in 1853, when the eldest brother, Jacob, was the first to join Charles in Arlington after several years of making piano cases for the firm of J.C. Lane in Leominster. Brother Peter had arrived in 1850 at age 20 to apprentice. In 1853, Theodore, then age 21, arrived from the vineyards he had tended for several years at his father's new, enlarged farm and public house in Kongenheim. He joined the elder brothers in a joint venture, which would last nine years until 1862. In 1857 the youngest and

last brother, Frederick, arrived in New York City from Le Havre on the ship, *Princeton*, accompanied by his fiancée, Thekla Breivogel. Five days later Thekla and Frederick were married in the Zion Evangelical Lutheran Church of Boston's South End, an early Greek revival brick building with classic pediment, which Jacob co-founded and helped to dedicate on Christmas Day, 1847.

As the first German to arrive in 1838, Jacob maintained his connection with the Zion Lutheran Church he helped to found, often "supplying the pulpit" himself in the absence of the minister. By 1853, however, he had begun to think better of settling on the scantily filled lands and commercial wharves of narrow Boston Neck. He had already buried two wives due to illness. He had worked in several piano factories in Boston and after 1842 had lived during an unhappy time of recession when his nearest brother, Ludwig, arrived to apprentice in woodworking, was forced to work in a lead-paint factory and fell ill with typhoid fever as well as lead poisoning. After a return to Germany, Ludwig reappeared in Boston in 1849, but passed through quickly, as if shaking the dust of Boston from his feet. He headed west to do what he had always wanted to do, to farm — first in Indiana and later in Missouri.

Perhaps also, Jacob found Leominster too undeveloped for a boy from the Rheinland. His foray there could have influenced his decision to join his brothers at 1171 Massachusetts Avenue in West Cambridge, a name Arlington retained until 1867. This was a proper town, yet with large tracts of undivided land, particularly in the Heights. The terrain was rougher for farming here than on the fertile eastern plain. But it was attractive for residences and businesses. In the coming decades, the Schwambs bought several of these areas from their Yankee owners. Jacob remarried again after two years, in 1855, to Katherine Guething. The couple added five more children to Jacob's previous five; and the good Katherine had the grace to outlive Jacob by six years and, with two of her sons, to continue until her death in 1887 the piano-case and straight-molding business Jacob had established at 1033 Mass. Avenue. The story of Jacob's mill didn't end there either: Jacob's youngest sons, William and Edward, carried on a furniture repairing and refinishing business together at 1033 Massachusetts Avenue until 1903, the year of William's death. As late as 1926, *The Arlington Advocate* reported that Edward Schwamb was still running the furniture refinishing business in the same place. And a jolly side of Edward came out in his obituary in 1946 when he died at 84. He was characterized as a notable musician who led the music program for the town's Centennial Celebration in 1907 and was the leader of the Arlington Zouaves Band. The Zouave soldiers were originally Civil War regiments with colorful costumes meant to resemble Berber tribesmen. Naturally, the story of Jacob's offspring doesn't end with the childless Edward. It is included to show the endurance, even of the least known of the Schwamb Mills, and the love of making music that ran through the German population in general, and the Schwambs in particular.

The business that the brothers started in 1853 was called, "Charles Schwamb and Brothers." This underlined the role of Charles as organizer. Jacob pioneered by scouting territory and pinpointing piano production as a skill with a future: Now Charles saw strength in numbers for the immigrant brothers and launched the enterprise. The location at 1171 Mass. Avenue had an attractive house, two hams and a mill wheel. During the firm's nine years of operation, the younger brothers apprenticed, became journeymen and joined the partnership. After the partnership was dissolved in 1862, the brothers started three separate businesses. Jacob, ever the restless family member, located himself in West Medford to make organ-cases for home use, a product of Mason and Hamlin Company. At the end of his career, Jacob returned to Arlington at 1033 Mass. Avenue where he ran his own mill until his death in 1881.



Theodore Schwamb

Theodore set his course to acquire 1171 Mass Avenue. It is not clear why he first located for a few years at 1093 Mass. Avenue near Hobbs Mill. He was determined to continue in the piano-case business and his eye was on the original location. By 1871 he was back at the Dodge homestead and had also acquired the Stephen Cutter Mill behind the house. Here, the largest of the three German mills in Arlington grew, the firm of Theodore Schwamb Company destined to last one hundred ten years and to remain important as the first and central location. The brothers all worked and lived close to one another for the rest of their lives, lending a hand in crises, and investing heavily in locations near one another in the Heights section of Arlington.

Sometime around 1850, Charles met Jane Sophia Hinton in the Choir of the First Parish Congregational Church (now Unitarian Universalist) in Arlington Center. Jane had been born in Birmingham, England. In 1852, Charles married his Jane and became the only brother to marry a girl with a non-German name. In this large, close-knit German family, one hopes that Jane managed to understand some German. Although Charles continued to walk often to Boston to attend services in German at Zion Lutheran Church in the South End, he was eager to become American as soon as possible; and an English-speaking wife fitted this plan.

A tragic event occurred in the brothers' collaboration in 1858, when a younger brother, Peter, died on March 24. We do not know the cause, but he had married Clara Buecher, an immigrant from Graach, Rheinpreussen, only one year earlier and his first child, Peter, Jr., was only one-and-one-half months old at the time of his father's death, suggesting a sudden and unexpected event.

Two years later, in 1860, Theodore married Peter's widow and adopted Peter, Jr., showing a trait he would carry through his life—the instinct of a good administrator to bring people together for the greater good of the whole. Charles, who was imaginative as an innovator, did not have the same ability to integrate his personnel. In 1864, for instance, Charles and Frederick opened a niche business on Mill Lane just a short distance upstream from the Dodge location. The Woodbridge Spice Mill had come up for sale after a fire. Here Charles and Frederick installed their lathes and introduced a new technology directed at the thriving market clamoring for oval frames: The business was successful, yet Frederick remained only three years, leaving with his wife Thekla Breivogel for New York State, and ultimately for Blue Island, Illinois, a suburb of Chicago. It was as if Charles instilled his spirit of adventure in others, but not in a manner that was to his own advantage.

The new wooden oval lathes offered technology capable of turning out perfect ovals of all sizes in large numbers, requiring skilled workmanship especially in the final contouring with a hand chisel on the double-axis lathe. The whole system was still powered by water. The enormous waterwheel, 18 feet in diameter was partially recessed under the basement floor, allowing for an "overshot" wheel, which channeled the water over the top. This was all going on, right under the feet of the workmen. Accustomed as we are to contemporary power sources, it is hard to believe this sophisticated shaping and carving was still deriving its energy from rough water flowing over a submerged wooden wheel. It had been so for thousands of years. But it seems somehow incongruous in the context of the burgeoning industrial age of the 1860s.

A similar example of Theodore's approach occurred in 1882. A plea came from Peter's nephew, Philip Eberhardt, in Guntersblum, Germany. Philip's mother, Katarina, was Theodore's sister, who died when Philip was only three. Philip suffered abuse from the husband of a kindly aunt, with whom he now lived. He begged his uncle in a letter to be allowed to come to the States. When Philip's ship arrived in New York, he was met by a Geunan customer of Theodore. But when he arrived in Providence on shipboard to Boston and could no longer hear German but only the "barbaric" English, he fell to weeping: "I was the most homesick boy you ever saw," he wrote many years later. "I laid my head on

the rail of the boat and cried my heart out. An old gentleman came and spoke to me but I cried all the harder until a young man who could speak German spoke to me and sort of straightened me out. I could not go into my stateroom but slept in one of the large chairs in the saloon. The next morning I arrived in Boston and was met by my sister and Mrs. Theodore Schwamb. On the following day, June 17th, I went to work and have been working ever since." For the first two years in Arlington, he remembered thinking that he would have returned immediately to Gettysburg if he could have. Nevertheless, he prospered at Theodore Schwamb, becoming superintendent of the entire plant in 1890, and then partner and director of the corporation in 1897. At Peter's retirement in 1924 Philip Eberhardt became president of the Theodore Schwamb Company. He continued to work there, even after the company was bought out by the Nickerson family in 1931, until the onset of his fatal illness shortly before his death in 1938.

Theodore's great talent for attracting and keeping talent was especially strong within his larger family. After Theodore's only son by Clara died at the age of two in 1866, Theodore set his hopes on his adopted son, Peter, Jr. Peter became, one might say, a perfect adopted son. He completed M.I.T. and rose there to become a professor of Mechanical Design and Mill Engineering, and head of the M.I.T. Mechanical Laboratories. Moreover, in Peter, Theodore had a son who could enhance his own profile in civic affairs, particularly in the 1890s, when Peter served on the committees to build two of Arlington's three most beautiful schools, the old High School on Academy Street, now the Senior Center; and the Cutter and Locke schools, placed at strategic intervals along Massachusetts Avenue as far as Park Avenue in the Heights. For the planning of the Locke, Peter was Committee Chairman. Presumably due to the really outstanding aesthetic of their architecture, and their solid construction, these schools were saved from the wrecker's ball and even though they were threatened at times in the years when school divestment was the fashion, the premise being that the school-age population would continue to decline. In 1899 also, Peter Schwamb, a long-time member of the Arlington Water Commission, was, in the words of William Cutter, "instrumental in having the town admitted into the Metropolitan water system." He remained active at Theodore Schwamb Company and joined in its incorporation as Treasurer in 1897. After Theodore's death in 1909, Peter took early retirement from M.I.T. and worked even more closely with the company until his own retirement in 1924.

While Theodore Schwamb built his company slowly, Charles leapt ahead quickly. From 1864 to 1879, Theodore's expansion was slower than Charles's. In 1878, for instance, when the bulk of the Mill owners were awarded damages for the drastic curtailment of the waters of the Sucker Brook due to the excavation of the Heights Reservoir, Theodore received \$6,024.16. Charles Schwamb, on the other hand, still riding the crest of the vastly popular oval frame business, received \$11,587.58. In 1875, *The Arlington Advocate* noted that Charles Schwamb had acquired "a snug fortune" in his business. In October of that year, he organized a surprise party among his thirty-five mill workers to welcome his twentyone-year-old son, Carl William, into his business as a partner. "The men in the establishment last Friday evening, despite the unfavorable state of the weather, marched in a body to the residence of Mr. Schwamb to congratulate the new firm." The "residence" was an impressive new mansard-roof house, which Charles had recently constructed at what is now 22 Fessenden Street. What Carl William, an artistic young man, thought of joining a dusty business (it was apparent later that his lungs were delicate), is a good question. But if he had to choose sawdust, rather than music, nevertheless, he remained a dutiful son and partner in the firm. He was the only son available at that time. When his only brother, Herbert Page, reached maturity 11 years later, he chose to go west to Denver. Within these limitations, Carl and his parents seemed to understand one another. He served as alternate organist, not only at the First Baptist Church where the family worshipped, but at various churches in the Heights and in Lexington. He was pianist for many years for the Sunday school of the First Baptist; and he designed music curriculum for the Arlington schools. Carl William died at the relatively early age, of 57 in 1912; yet for many decades thereafter a harpsichord stood on the third floor of the Mill as a reminder. In gratitude for Carl William's

contributions to the First Baptist Church in Arlington Center, the parish gave him an intricately carved square piano, an instrument which has been lovingly restored in the family of his granddaughter, Dorothy Sweet Raman, of Macomb, Illinois.

In 1879, the market for oval frames collapsed as square frames became the fashion. To the array of modern equipment Charles already had — rotary planers, band saws, circular saws and jigsaws, boring machines used for dowelling, and common and eccentric turning lathes — he now installed a molding machine, capable of being set to finish any possible design for straight stock, and to fashion any contour a frame maker might want. An enlarged second floor was added to accommodate the long lengths of stock. Charles was also helped with orders subcontracted from his brother, Jacob, who had for several years been operating in his own Mill at 1033 Mass. Avenue next to the building that is today Stop and Shop Pharmacy. (Not until 1919 did this parcel go out of Schwamb hands, when it was sold to a manufacturer of electric repair parts, and carbon and metal brushes used in automobiles. *The Advocate* reported that “The building is of the olden time construction and the timbers are put together with wooden pins, heavy timbers being used and many of them, quite a contrast to the buildings of today”. In recent years, several nostalgic mill enthusiasts have looked for this treasure, only to leave again cursing the brick-cube apartment building which has replaced it.)

In the early 1890s, America experienced a severe economic panic, followed by a prolonged recession. It is therefore surprising to read that the Theodore Schwamb Company saw constant growth, both in the 1890s and in the first years of the new century. In 1898, the year after its incorporation, the Company was the largest single business in Arlington. Directors were Peter Schwamb, Treasurer, Philip Eberhardt, Clerk and Assistant Superintendent, and Jacob Bitzer, Head of the shop. New property was purchased behind the Mill in 1905. In the same year, a narrow-gauge spur railroad track was added, linking the firm to the railroad and enabling the company to receive and deliver almost in the manner of a private railroad. Among the new structures, the largest was the four-story brick building, which today still bears uppermost on its facade the words, THEODORE SCHWAMB CO., ready for the passers-by of the twenty-first century.

As the middle class began to upscale its musical tastes in the new century, the vogue for upright pianos gave way to the aspiration for a grand piano. Theodore Schwamb Co. followed the trend, which required not only skill but speed and coordination in gluing veneers to its fine hardwoods. As the new century dawned, however, the first generation seemed suddenly to have grown quite venerable. At Charles Schwamb and Son Co., the heir apparent, Carl William, was on a protracted stay in Denver to improve his health. At the Mill, shop superintendent, John Frederick Bitzer, oldest brother of Jacob Bitzer, carried on as he had for 36 years. One cannot see how much sales work could have been going on.

For Charles, by nature an energetic entrepreneur, looking back from the vantage of 1900 must have been daunting. Of the nine children born to him and to Jane Hinton, seven were dead. Two sons and a daughter died shortly after birth; but the unthinkable happened from 1884 to 1891. His four grown daughters, lovely young women if one may judge from their photos, all died, one after another in successive years. Evidence strongly suggests a family tendency to tuberculosis, though the only written evidence concerns their youngest daughter, Jennie Louise Schwamb Wyman, who had recently given birth to a daughter. Two weakening bouts of pneumonia are mentioned, one before and one after the baby's birth (the baby also died within a few months). When Charles Schwamb died in 1903 at the age of seventy-six, his faithful superintendent, John Frederick Bitzer, resigned immediately and joined his youngest brother, Jacob Bitzer, at Theodore Schwamb, where he remained for the rest of his professional life.

When Carl William returned from Denver he found the mill almost without business and he retired in 1905. This is the point at which the Schwamb energy sprang up again: his two sons, Clinton W., 26, and Louis, 19, suddenly acquired a frantic determination to save their Mill. In 1907, under the new name of "Clinton W. Schwamb and Co.," they hoisted the red, white and blue bunting to the Mill's facade for the Centennial Celebration of the town's independent status. Under the company's name were emblazoned the words, "OLDEST OVAL FRAMEMAKER IN NEW ENGLAND." The firm was old—the partners were young! Clinton and Louis were not shy about invoking antecedents, if it served their purpose. The entrepreneur knows how to pick himself up because risks involve falls, and entrepreneurship is risky. Over years of hard work, Clinton and Louis brought the Mill back to prosperity.

Clinton's son, Elmer Schwamb, was born in 1904. When talking to Patricia Fitzmaurice in earlier years, Elmer remembered how hard his father and uncle worked to save and restore the Mill; and how he himself entered the business in the 1920s, traveling the length the East Coast on sales trips. The Mill stayed profitable and Elmer even added a niche partnership called "Elwayne," involving his son Wayne for the production of specialty frames. In the end, it was the advent of molded plastic and the ever-worsening quality of lumber that forced Elmer Schwamb, after the death of his Uncle Louis, in 1967, and that of Clinton in 1968, to sell what was to become the Old Schwamb Mill.

The buyer had plans to raze the building and blacktop the lot for parking. But luckily Patricia Fitzmaurice, who was already an ardent preservationist, happened by on her bicycle one fall day and learned the plans. She saw the historic exterior, and even more surprising, the incredible array of period tools and machines within. With the help of a small group of concerned Arlingtonians, she started the process that would result in the creation of a working museum, the Old Schwamb Mill, now in operation for 35 years.

Theodore Schwamb died in 1909. The piano-case business began to lag with the increasing interest in recordings, and especially with the advent of the radio in the early 1920s. Peter Schwamb retired in favor of Philip Eberhardt in 1924 and died unexpectedly in 1928 in the midst of his family at his house at 33 Academy Street. When Philip Eberhardt sold the business to the Nickerson family in 1931, the company name of Theodore Schwamb was retained. A decision was made to switch products to high-end architectural woodworking. This was a felicitous decision, given the extensive interior areas available and the skills, particularly of Italian workers, in the area. During the next forty-plus years, the Theodore Schwamb Co. became known nationwide for large projects of interior wood paneling and woodcarving.

Their work included elaborate projects for Yale University in New Haven; for the Tryon Palace at New Bern, North Carolina; for the original John Hancock Building in Boston and at the Harvey Firestone Library at Princeton, N.J. The firm of Cascieri di Biccari (the late Archangelo Cascieri, Dean of the Boston Architectural Center and Adio di Biccari, Arlington sculptor) opened a studio at Theodore Schwamb. Over four decades, this firm produced a wealth of carving and sculpture, including the exquisite Cascieri carvings for Marsh Chapel at Boston University; and the di Biccari sculpture ensemble opposite West Street on the Boston Common. One photo, taken in Arlington at the Schwamb Studio in the 1950s, shows a giant sculpture of St. Clement. The ponderous saint lies prone on a truck, having made it through of the wide doors of the Schwambs' most attractive structure, a small, classic brick building with brick detail, a building still extant today at 1167 behind the old homestead. After arriving safely at his Brighton destination, St. Clement was hoisted to very top of the facade of St. John Seminary.

The fact that such buildings still exist is to the credit of the Mirak family, a long-time Arlington family whose firm has specialized since 1936 in dealerships and service of cars and trucks. Recently, the firm developed a residential complex in Arlington Center called "The Legacy." Robert Mirak recently commented that "when my father, John Mirak, purchased the property in the 1970s, some of his

colleagues suggested tearing down the buildings to make way for another dealership or a major shopping center. My father decided to keep the buildings and used the property to store excess auto inventory. In addition, he liked the looks of the buildings and especially the handsome red brick and the colonial windows. From that time to the present, my father and in succession, the family has upgraded the buildings. Inside, over the decades, we have upgraded floors and brickwork. Specifically, the original wood flooring, which was blackened by use, was cleaned, sanded and urethaned to a handsome finish. Also, a number of walls were sandblasted to remove the paint on the brick; the results were sparkling."

At this Theodore Schwamb complex, it is gratifying to see how many small businesses have found a home: the Image Inn has run a photographic studio there since 1982, specializing in the rare skills and patience required by traditional techniques; the architectural firm of Rovinelli is upstairs at 1167; and there are many individual artists in residence at the large complex at 1165, as well as the new WorkBar, established in 2016.

The Charles Schwamb Mill at 17 Mill Lane did not grow as large as the Theodore Schwamb Company, and it was never as visible, either. But however much the market fluctuated, Charles Schwamb and his descendants never gave up making fine oval frames. Amidst the final commercial years of competition from inferior wood and plastics, the Mill continued this work, as it does today, thanks to the late Patricia Fitzmaurice and her supporters.

In the end, the Old Schwamb Mill can lay claim to having endured, both as living history and as a working Mill. All three brothers, Theodore and Charles and Jacob, could be proud that their generation of immigrants achieved so much that is still treasured in Arlington today.

TIMELINE of the Schwamb Mill & Mill Brook

1630 English Puritan colonists first settled in Cambridge, Massachusetts in 1630 during the thirty years of the Great Migration. They brought with them, from England, the waterpower mill technology that was implemented on Mill Brook in Arlington for 235 years (after which a steam turbine replaced the water wheel). The Mill Brook, which drops more than 150 feet in two miles through Arlington, powered mills of various kinds at seven to nine mill sites. The brook has been called successively Vine Brook, Sucker Brook, and Mill Brook. According to one local historian (Edith Winn), the brook was a "mighty rushing river" at the end of the last ice age.

1637 The first mill on the Brook in Menotomy, or the Northwest Precinct of Cambridge (now Arlington), was the earliest water powered gristmill within the limits of colonial Cambridge. It was financed by Dr. Samuel Read of England and was established in 1637 by Captain George Cooke (b. c. 1610; d. Apr 1652) near the present day location of the Community Safety Building on Mystic Street in Arlington. Cooke's Mill is now commemorated by a park, Cooke's Hollow, and a bronze tablet.

1638 Edward Winship bought a three-acre estate at the easterly corner of Brattle and Mason Streets and extending through the Cambridge Common (in Cambridge). He was a Lieutenant of Militia in 1660, a Selectman for 14 years between 1637 and 1684, and a Representative in the General court for eight years. He died on 2 Dec 1688.

Cooke had sailed for New England in the ship Defence in 1635, at the age of 25. In Massachusetts, on 3 Mar 1636, he was admitted as a freeman. From there he became a representative in its Assembly, and Speaker in 1645. In addition, he had been appointed Captain of the Artillery Company in 1637 and once returned to Boston with nine Indians captured during an "excursion".

1639 The Squaw Sachem (i.e. woman chief) of the Massachuset (<http://dickshovel.com/massa.html>) tribe ceded all the lands of her tribe, excepting her homestead (which was bounded on the east by the Mystic Lakes and on the south by Mill Brook), to the English Puritan settlers of Cambridge, for "twenty and one coates, ninten fathom of wampom, and three bushels of corne". Three epidemics of European diseases and warfare with the Abenaki (<http://www.dickshovel.com/aben.html>) tribe from the north had greatly reduced the number of men in the Massachuset tribe. The survivors were too few to defend their land against the invaders from England and had little choice but to agree to the contract. The Squaw Sachem (whose name is unknown) died in 1658. The exchange of property is illustrated in two local WPA murals: *Purchase of Land from the Indians* by Aidan Lasell Ripley, 1934, in the Winchester MA Public Library, and *Purchase and Use of the Soil* by William A. Palmer, 1938, in the Arlington MA Post Office.

Many of the principal inhabitants of Wexford as well as several hundred females gathered around the great cross in the marketplace of Wexford in the hope that their defenseless condition would move George Cooke and his men to compassion. However, Cooke butchered all of them and filled the marketplace with their blood.

1645 Captain George Cooke abandoned his mill, returned to England, and joined Cromwell's army as Colonel of a regiment of foot soldiers. Puritan "Roundheads" formed the backbone of Cromwell's forces. On 11 Oct 1649, Cooke's regiment captured the town of Wexford (in County Wexford, Ireland). Cooke became governor and "exactd bloody retribution against the defending Irish". Houses and cabins, and stores of livestock and corn were all plundered and burnt. Cooke insisted that this was the only way to subdue the roving parties of Irish, by denying them sustenance and shelter in the region.

Dr. Lynch describes George Cooke, the commander of the Puritans in Wexford, as especially remarkable for his brutality and cruelty. Having given a security to the inhabitants of Wexford that they might reside in their own homes, "Cooke afterwards authorized Captain Bolton, before the extirpation of the stipulated day, to scour that county with his cavalry and plunder it. Then commenced an indiscriminate massacre of men, women, and children, by which not less than four thousand souls, young and old, were atrociously butchered."

In 1652, General Cooke shut up 300 men and many infants in a house in the county of Wexford, and then setting fire to the house, all were burned in the flames. But Captain Gore, one of the officers under Cooke, succeeded in concealing on his horse, under his cloak, a little boy who had escaped out of the house. Cooke, discovering the fact, severely condemned the captain, and returning himself with the boy, hurled him into the flames.

In April 1652, Cooke and his mounted escort had a running fight with the troop of the Irish patriot, Captain Nash, on the road from Gowran to Loughlin. Both Cooke and Captain Nash were found dead after the battle.

Cooke's mill in Menotomy was allowed to decay and eventually crumble away.

1670 Cooke's daughter Mary, then living in England, sold her father's 600-acre farm at Cambridge Farms (now Lexington) as well as the twenty acres of land in Menotomy (now Arlington) to John Rolfe of Nantucket. (Ref. 7, page 235.) Rolfe erected an entirely new waterpowered mill on the old site.

1681 John Rolfe died. His widow, Mary (Scullard) Rolfe, sold a fifth of the Cooke farm at Cambridge Farms, or 120 acres of land. She and her son Moses laid out the second Mill Brook watermill power system of pond, dam, mill, and mill race at what is now Mill Street in Arlington. They first built a dam but then waited several years before completing the entire mill raceway system.

1684 The third watermill power system of ponds, dam, mill, and mill race had been laid out before 1684, and a mill built by David Winship, at the Foot of the Rocks in the Menotomy section of Cambridge. This is the site of the present Old Schwamb Mill.

This third mill privilege, at the Foot of the Rocks, was willed to Joseph Winship (b. 21 Jun 1661; d. 18 Sep 1725; resided in Menotomy) by his father, Lt. Edward Winship, who had also built mills in Lexington at the edge of the Great Meadow. Evidence of a mill pond is still visible as a grassy park near Bow Street.

1688 Lieutenant Edward Winship died on 2 Dec 1688 and left to his son Joseph "a certain gristmill in Cambridge, with all and singular the dam, flooms, mill-pond", etc. This mill was on the site of what is now called The Old Schwamb Mill.

1704 William Cutter built a dam 18 feet high near his home at the present Mill Street, raised the level of the pond, and erected a sawmill.

1714 Moses Rolfe, a son of John Rolfe, sold 130 acres of Cooke's farm to John Cutter (a glazier b.1690), a son of William Cutter.

1718 Moses Rolfe sold 100 acres of the Cooke's Farm to his brother-in-law, William Cutter, husband of Moses Rolfe's sister.

1732 On 27 Dec 1732, the General Court designated the part of Cambridge on the west side of the Menotomy River (now called Alewife Brook) as the Second or Northwest Precinct of Cambridge. This was the beginning of the First Congregational Parish, the parish being simply the precinct in its religious relations.

After several changes of name the First Congregational Parish eventually evolved into the First Parish Unitarian Universalist Church of Arlington.

1775 On the first day of the American Revolution, Paul Revere and the British regulars all passed at a distance of about 200 yards from the Mill at the Foot of the Rocks on their way to Lexington and Concord. The British returned by the same route, fighting their way through Menotomy on their way back to Charlestown.

1807 In 1807, Menotomy (which was officially called the Northwest or Second Parish of Cambridge) became a separate town, West Cambridge.

1808 In 1808, Stephen Cutter constructed another sawmill on the pond at Mill Street.

1827 In 1827, Mary Cutter, the widow of Stephen Cutter, granted land abutting the Mill Pond to the Baptist Society "for the erection of a meeting house with the privilege of using so much of the mill pond as necessary for the ordinance of baptism." Sylvia Brazy was baptized on 3 June 1827.

1838 Jacob Schwamb emigrated to Boston from Untenheim, Rhein Hessen, Germany. Jacob was the first of the Schwamb brothers to immigrate to the United States. By 1857, six of the seven Schwamb brothers had emigrated from Rhineland Pfalz to the United States.

1846 The Lexington and West Cambridge Rail Road commenced service between Bedford, Lexington, Arlington (then called West Cambridge), and Boston.

1847 Charles Schwamb emigrated to Boston from Udenheim, Rhein Hessen, Germany to join his older brother Jacob in the burgeoning Boston piano industry.

1850 Charles and Jacob Schwamb moved to the Dodge Mill (built by Gershom Cutter) on Mill Brook (1167 Massachusetts Avenue) to make piano cases. They were joined by brothers Peter, Theodore, and Frederick.

1853 From 1853 to 1862, Charles, Jacob, Theodore, Peter, and Frederick Schwamb operated a collaborative piano-case business at 1165 Massachusetts Avenue in West Cambridge (now Arlington).

1858 Peter Schwamb died suddenly, leaving a widow and a two-month-old son, Peter Schwamb, Jr.

1860 Theodore Schwamb married the widow of his brother Peter. Theodore adopted Peter Jr. who would become a professor and Director of the Mechanical Laboratory at MIT and Treasurer of the Theodore Schwamb Company at 1165-1171 Massachusetts Avenue in Arlington.

After ownership of the Foot of the Rocks Mill property had descended through many generations, it was acquired by Henry Woodbridge for grinding spices. The mill was severely damaged by fire in 1860.

1861 The Woodbridge Spice Mill at the Foot of the Rocks was rebuilt on the old foundations circa 1861.

1862 Theodore Schwamb founded the Theodore Schwamb Mill to manufacture piano casings. The address later became 1165 Massachusetts Avenue in Arlington, Massachusetts.

Frederick shortly left for Chicago and the lumber business. Frederick and his wife (Thekla Breivogel) were living in New York State in 1871.

1864 Charles Schwamb and his youngest brother, Frederick, acquired the Woodbridge Spice Mill at the Foot of the Rocks. Using skills that they had developed in their native Germany and in their American apprenticeships, they converted the mill to woodworking, especially for making oval frames for portrait photographs. They installed shaft and pulley belt-driven machinery, including German eccentric faceplate lathes and a moulding machine. Four generations of descendants of Charles Schwamb operated the Mill until 1969.

Theodore Schwamb and Peter Schwamb acquired the Dodge Mill. Jacob Schwamb, the oldest of the Schwamb brothers, opened his own piano case business.

1865 The popularity of the oval portrait frame arose just after the Civil War along with the increasing accessibility of photography. Beginning then, the Old Schwamb Mill became the leading maker of hand-turned oval and circular portrait and mirror frames in the United States.

1867 In order to distinguish itself from its parent community and to honor its Civil War heroes, the town changed its name from West Cambridge to Arlington on 30 April 1867.

1869 A new three-story wing was added to the Old Schwamb Mill in 1869 to provide for a four-sided moulding machine on the first floor and finishing rooms above.

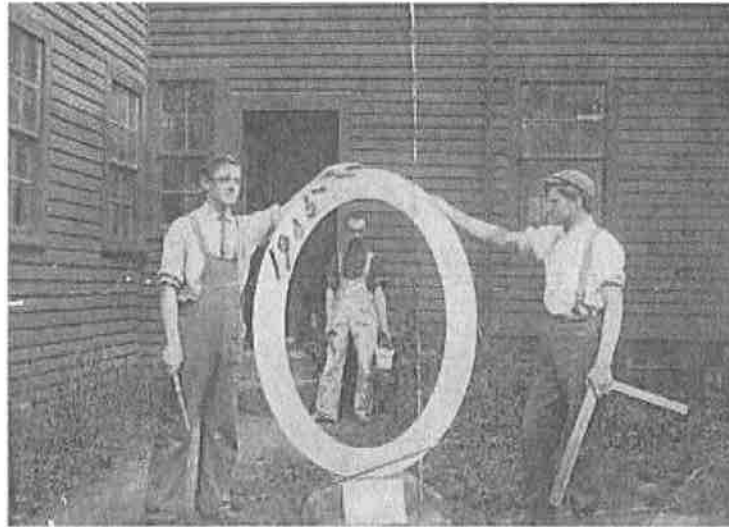
1872 The Town of Arlington took Mill Brook for a public water supply. The Charles Schwamb Mill at the Foot of the Rocks installed a steam engine in the cellar of the barn. A 40-foot-long underground drive shaft transmitted power to the Mill machinery.

1875 Charles's son Carl William (or "Will") was taken into partnership. Carl often played the organ at the First Baptist Church in Arlington. There is a report that Carl was the organist at the Follen Church (Unitarian) in Lexington.

1883 A two-story ell was added to the Mill in 1883 to provide a first-floor office and a shipping room above.

1888 A water turbine was added to the Charles Schwamb Mill at the Foot of the Rocks in 1888 to supplement the existing steam engine power.

1905 Carl's sons Clinton and Louis acquired the Mill property and business, which they named the Clinton W. Schwamb Company.



*In the
photo
above,
Clinton
is on the
left and
Louis is
on the
right. The
date
"1905"
was
written
by pencil
on the
print that
was
scanned,
not
written
on the
actual*

*wooden
frame.*

1922 The Theodore Schwamb Mill included seven buildings and had about 100 employees.

1928 A nephew of Theodore Schwamb assumed ownership of the Theodore Schwamb Mill. He discontinued manufacture of piano casings and began to manufacture architectural woodwork.

1931 The Theodore Schwamb Mill was reorganized by Donald E. Nickerson, Donald A. Davis, and Alvin W. Davis.

1940 The Theodore Schwamb Mill added an ecclesiastical department which included Arcangelo Cascieri as resident sculptor.

1942-1945 For the duration of World War II, the Theodore Schwamb Mill discontinued all civilian work. It produced millwork and cabinet work for military bases, Liberty ships, and PT boats.

1954 The Clinton W. Schwamb Mill installed electric motors and sold its steam engine. The original 19th century shaft and pulley belt-driven system remained in place to transmit power to the individual machines throughout the Mill.

1969 Deaths of Clinton and Louis Schwamb, and the approaching retirement of Clinton's son Elmer, prompted Elmer Schwamb and Louis's widow to enter into a purchase and sale agreement with neighboring lumber terminal truckers to honor Clinton's promise to the truckers to provide additional truck access to their property. The plan of the truckers called for demolition of the three Mill buildings.

The Schwamb Mill Preservation Trust, a nonprofit charitable educational trust, was formed by four Arlington Conservation Commission members:

Patricia C. Fitzmaurice (1923-2001)
Doris Atwater (now Bouwensch)
Rudolph Kass
David D. Wallace

The purpose of the Trust was — and is — to raise funds to save the Mill, to maintain the production of oval frames, and to exhibit the Mill's collections and traditions. This was apparently the first case of grassroots historic industrial preservation in America.

1970 On 16 Jan 1970, the Old Schwamb Mill was acquired by The Schwamb Mill Preservation Trust with contributed funds from two Boston foundations, a Cambridge bank, and several individual donors. The Trust appointed Patricia C. Fitzmaurice as Managing Trustee, a position which she held until her death on 15 Feb 2001.

During the years following the acquisition, frame makers working at the Mill included

- David Graf: Current woodturner
- David Hogan
- Walter Horak
- Ronald J. McLellan (15 May 1924-30 Dec 1995)
- Gordon E. Richardson (10 Aug 1902 — 23 Jan 1990)
- Gordon Whitermore.

After being acquired by the Schwamb Mill Preservation Trust, the Old Schwamb Mill continued to manufacture museum-quality frames but relied on the additional income that it received from donors and appropriate tenants.

In the summer of 1970, the Old Schwamb Mill created a Craft Center which offered 10-week courses in:
Silver Jewelry Making taught by *H. Val Fay*
Printmaking taught by *Anthony Pilla*
Pottery and Ceramics taught by *Nadine Hurst*
Clay Sculpture and Pottery taught by *Lisa McLean*
Furniture Refinishing taught by *Bron M. Warsaskas*
Waste Conversion taught by *Richard Darling*

In the autumn, the Mill added courses in Life Drawing, Water Color Painting, Italic Lettering, Gold Leafing, Furniture Stenciling, Weaving, Leathercraft, and Basic Oil Painting.

Part of the second story of the Mill was rented to The Hart Viol Workshop. The proprietor, Richard Hart, manufactured Viols da Gamba, Vielles, Psalteries, Rebecs, Fiedels, and other Mediterranean and Renaissance string instruments.

Two potteries were started at the Mill: the Barn Potters, Cora Pucci and Kathy Ingoldsby; and the Mill-Race Pottery with Telle Bjork and Nadine Hurst.

1971 The Theodore Schwamb Mill closed. That property was acquired by another immigrant entrepreneur, John P. Mirak, partially for use by his automobile dealership and partially for lease to numerous small businesses.

The Old Schwamb Mill was listed in The National Register of Historic Places by the Secretary of the United States Department of the Interior for the Mill's national historical significance.

1972 The Old Schwamb Mill held its first annual "barn sale." This fundraising event was continued for at least three years.

1975 The Old Schwamb Mill obtained the last remaining timbers from the "Washington Elm" (under which General George Washington assumed command of all colonial troops on 3 July 1775). The Mill manufactured for sale 75 spandrel frames using wood from the Washington Elm. Each frame contained a print showing Washington taking command of the Continental Army.

1976 At the request of the Commandant of the First Naval District, artisans from the Old Schwamb Mill made an oak jewel chest from timbers of the USS Constitution.

J. William Middendorf II, Secretary of the United States Navy, gave the chest to Queen Elizabeth II at the time of her bicentennial visit to Boston.

1979 Shaker Workshops became a tenant of the Old Schwamb Mill in May 1979. They occupied the westerly half of the first floor of the main Mill building.

The Mill offered classes in Design, Advance Calligraphy and Manuscript Illumination, Life Drawing, Painting, Silver Jewelry, Stained Glass, Pottery, Woodworking with Hand Tools, Woodworking in Miniature, and Researching Old Houses.

1981 Artisans of the Old Schwamb Mill produced 13 oval display cases as part of the renovation of the throne room in the Iolani Palace in Hawaii. The cases are being used to display the jewels which kings, queens, and emperors gave to the Hawaiian royalty during their travels covering a period of 15 years. Each case has an oval shape and has a royal crest at the top. The oval cases were carved out of seasoned poplar. The crests were carved out of maple from the town of Wellesley.

1983 In Dec 1983, Shaker Workshops expanded its operations. They established their office in the upper level of the barn and used the lower level of the barn for production. Their showroom remained in the main building of the Mill.

1985 Sometime in 1985, Shaker Workshops moved its production to Fitchburg and expanded its showroom at the Old Schwamb Mill to occupy both floors of the barn. By Jan 1986, they had moved completely out of the main Mill building.

1988 The Massachusetts Historical Commission gave a 25th Anniversary Preservation Award to Patricia C. FitzMaurice for her preservation activities in connection with the Old Schwamb Mill.

2000 On 17 May 2000, Patricia Fitzmaurice received the Ayer Award from the Bay State Historical League for being “a visionary preservationist who recognized the historical and educational value of the Old Schwamb Mill property in Arlington in 1969 and since then has worked tirelessly in leading efforts to fulfill its mission.”

Today The site of The Old Schwamb Mill is now the oldest continuously operating mill site in the United States. The earlier mills are either long gone or no longer operating.

Schwamb frames and mouldings are in every major art museum in the United States and are included in the collections of the White House, the Vatican, Buckingham Palace, the Palace of the Kings of Hawaii, and the collection of Queen Sylvia of Sweden.

[WORDPRESS.COM.](https://oldschwambmill.org/schwamb-family/)



**Town of Arlington
Legal Department**

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MEMORANDUM

TO: Conservation Commission,
Emily Sullivan, Environmental Planner and Conservation Agent

FROM: Douglas W. Heim

DATE: September 3, 2020

RE: **Rivers Protection Act “Historic Mill Complexes” Exemption Standard**

Members of the Conservation Commission, I write at the request of the Chair to provide a basic overview of the “historic mill complex” exemption to Rivers Protection Act regulations, and to attempt to clarify the standards for reviewing the pending application for same relative to 1165R Massachusetts Ave.

G.L. c. 131 sec. 40: Massachusetts Rivers Protection Act Overview

The general purpose of the Rivers Protection Act, which is complimentary to the Wetlands Protection Act, is to preserve the natural integrity of rivers and adjacent land for the important values these areas provide within a wetland resource area known as the “Riverfront Area.”¹ In Arlington, the Riverfront Area is defined as 200 feet on either side of a perennial rivers and streams.

¹ As the Commission knows, the Rivers Protection Act considers the same categories of issues as the Wetlands Protection Act: protection of private or public water supply, protection of groundwater, flood control, prevention of

Historic Mill Complex Exemption

In recognition of the ways in which rivers were altered by historic uses of river mills throughout the Commonwealth, the Rivers Protection Act provides in relevant part:

*The riverfront area **shall not include land now or formerly associated with historic mill complexes** including, but not limited to, the mill complexes in the Cities of Holyoke, Taunton, Fitchburg, Haverhill, Methuen and Medford **in existence prior to nineteen hundred and forty-six and situated landward of the waterside facade of a retaining wall, building, sluiceway, or other structure existing on the effective date of this act.***

G.L. c. 131 sec. 40 (emphasis added).

However, the statute itself provides no further definition or guidance as to what constitutes a “historic mill complex” or how the exemption should be examined. 310 C.M.R. 10.04 offers some further definition as follows:

Historic Mill Complex means the mill complexes in, but not limited to, Holyoke, Taunton, Fitchburg, Haverhill, Methuen, and Medford in existence prior to 1946 and situated landward of the waterside facade of a retaining wall, building, sluiceway, or other structure existing on August 7, 1996. An historic mill complex also means any historic mill included on the Massachusetts Register of Historic Places. An historic mill complex includes only the footprint of the area that is or was occupied by interrelated buildings (manufacturing buildings, housing, utilities, parking areas, and driveways) constructed before and existing after 1946, used for any type of manufacturing or mechanical processing and including associated structures to provide water for processing, to generate water power, or for water transportation.

In one of the few matters further interpreting the definition of “historic mill complexes” a Department of Environmental Protection Presiding Officer held the exemption to apply to those historic mill complexes (and interrelated infrastructure) in existence before 1946 and until at least August 7, 1996. *In the Matter of 104 Stony Brook, LLC*, OADR Docket No. WET-2017-021, Weston, 25 DEPR 120 (2018).

Finally, it should be understood that the exemption afforded to historic mill complexes only applies to the Rivers Protection Act. It does not apply to the Wetlands Protection Act, state and local requirements for historic structures, or the Town Wetlands Bylaw.

storm damage, prevention of pollution, protection of land containing shellfish, protection of wildlife habitat, and protection of fisheries.

Standard for Exemption

In sum, based on the foregoing, the petitioner must provide evidence that the entirety of the area for which a waiver is sought was developed and used as a mill complex, including interrelated buildings, parking areas, driveways and similar infrastructure before 1946, and which remained in existence until at least August 7, 1996. They need not establish that the entire area was encompassed by the footprint of a building or specifically a “mill,” or even that buildings and/or relevant related infrastructure stands as to today. Rather, there must be sufficient evidence that the site’s buildings and related infrastructure served the purposes of working mills prior to 1946, which remained until at least the date of the passage of the Rivers Protection Act.

As a guidepost, the Hearing Officer in the 104 *Stony Brook* matter noted that the only evidence of mill use for the site at issue in that matter was the foundation of building which may have been used to house mill employees outside of the protected area. However in any event, that structure was demolished in the 1960s, which signified that no structures or infrastructure from what may have once been a historic mill complex existed within the riverfront area. Therefore, the obvious purpose of the exemption – recognition of the dramatic impact historic mills have on the riverfront areas – was moot, and had been for decades before the Act was passed.

While the facts of *Stony Brook* stand in dramatic contrast to the facts of the application before the Commission here, it is still essential that the Commission is satisfied that the mill complex and all of its related site area within the resource area was built before 1946, and remained until at least August of 1996.

It is essential to note that the 104 *Stony Brook* matter does not hold that a mill complex must be in *active* use as a mill until August of 1996, by which time many if not most of the mills in Medford, Methuen, Lawrence, and the other specific municipalities listed in would have long been shuttered for mill purposes. Rather, the common sense interpretation reflected in *Stony Brook* demonstrates that the concern of the exemption is the appropriateness of applying a second layer of riverfront regulation to sites in which the riverfront was dramatically engineered and altered for mill purposes.

Based on cursory review of other municipalities’ examination of exemption applications, in addition to the literature and supporting materials already provided by the Applicant, some of means of demonstrating the applicability of the exemption could be to search Massachusetts Historical Commission databases such as MACRIS, and consulting Town bodies, historical societies and resources to understand the scope of the historic use of the mill property and its related structures, and areas leading up to the Mill Brook.

Thank you for your consideration of the foregoing. Please advise me if I may be of further assistance on this or any other matter.

KRATTENMAKER O'CONNOR & INGBER P.C.

ATTORNEYS AT LAW

ONE MCKINLEY SQUARE
BOSTON, MASSACHUSETTS 02109
TELEPHONE (617) 523-1010
FAX (617) 523-1009

September 10, 2020

CHARLES G. KRATTENMAKER, JR.
MARY WINSTANLEY O'CONNOR
KENNETH INGBER

OF COUNSEL: RAYMOND SAYEG

VIA EMAIL

Susan Chapnick, Chairperson
Conservation Commission for the
Town of Arlington
730 Massachusetts Avenue
Arlington, MA 02476

Re: Request for Determination of Applicability – 1165-1167 Massachusetts Avenue,
and 0 Ryder Street, Arlington, MA (hereinafter referred to as the “RDA” and the
“Property”, respectively)

Dear Chairperson Chapnick:

This office represents 1165R Mass MA Property, LLC (the “Applicant”), in connection with the development of the Property pursuant to the Comprehensive Permit Regulations, so-called.

I write to follow up on the matters raised at the September 3, 2020 meeting of the Commission as to the Applicant’s RDA requests. Those requests include the following:

- ***Whether the Property constitutes an “Historic Mill Complex” as defined under 310 CMR 10.04, the Massachusetts Wetlands Protection Act.***

As Attorney Douglas Heim, Town Counsel for the Town of Arlington, opines in his September 3, 2020 memorandum to the Commission on the River Protection Act “Historic Mill Complex” exemption standard, the Applicant: (a) must provide evidence that “the area at issue was developed and used as a mill complex, including interrelated buildings, parking areas, driveways and similar infrastructure before 1946”; (b) “need not establish that the entire area was encompassed by the footprint of a building or specifically a ‘mill’, but rather there must be sufficient evidence that the site’s buildings and related infrastructure served the purposes of working mills prior to 1946”; and (c) must establish that “the mill complex and all its related site area within the resource area . . . remained until at least August of 1996.”

Town counsel specifically notes that the mill complex need not be in “active use as a mill until August of 1996”. In support of this conclusion, he cites the language of the regulation and notes that the mills in many of the cities and towns specifically referenced in 310 CMR 10.04 “would have long been shuttered for mill purposes.” Thus, the only logical conclusion is that the mills need only have been working mills until 1946, so long as the buildings themselves have remained as of August, 1996.

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September 10, 2020
Page 2

It is uncontroverted that the Property contained working mills prior to 1946. Documentation establishes the following:

- 1807 – Mill buildings were erected for turning and grinding edge tools by Gersham Cutter. Paul Dodge acquired the mills and subsequently sold the mills to Charles Schwamb, Dodge's apprentice, in 1848.
- 1850 – Charles and Jacob Schwamb moved their business operation to 1167 Massachusetts Avenue, formerly called the Dodge Mill, to make piano cases.
- 1853 – Charles and Jacob Schwamb were joined by Theodore, Peter and Frederick Schwamb, who operated a collaborative piano case business at 1165 Massachusetts Avenue.
- 1897 – The business was incorporated as the "Theodore Schwamb Company".
- 1905 – the Theodore Schwamb Company erected another four-story brick mill building to meet increased demand for piano cases.
- Around the 1920's with the popularity of the radio and the decrease in piano sales, the Theodore Schwamb Company in 1928 turned to another kind of manufacturing work, specifically "Architectural Woodwork". This included the manufacturing on the Property of door frames, baseboards and all other kinds of finished woodwork for homes and buildings.
- In 1931, the Theodore Schwamb Company was sold to the Nickerson Family, which continued the architectural woodworking business on the Property.
- In 1942, the Theodore Schwamb mill discontinued civilian work and during the period 1942-1945, the duration of World War II, produced mill work and cabinet work for military bases, Liberty ships and PT boats. After World War II ended, the company resumed its civilian architectural woodworking business.
- In 1971, the Theodore Schwamb mill closed its manufacturing operations and was purchased by John Mirak, the grandfather of Julia Mirak Kew, whose family continues to own the property.

Also enclosed is a plan dated July 16, 1956, titled "The Theodore Schwamb Co., Inc.", which likewise definitely establishes the mill use subsequent to 1946.

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- *Whether the mill buildings utilized by the Schwamb family for their manufacturing business continued to exist on the Property as of August, 1996.*

The redevelopment proposed intends to: (a) retain and repurpose as housing the four-story mill building built in 1905; and (b) retain and repurpose for amenities space the one-story concrete and brick building, formerly the Engine Room built in 1906.

As detailed above, there is ample evidence to establish that the Property housed a "Historic Mill Complex" as defined in 310 CMR 10.04. Further, though the Applicant need only establish that the Property was a functioning mill through 1946, the Applicant has provided sufficient evidence to establish the Property was used for manufacturing until 1971.

A site visit and the photographs provided clearly establish that "the mill complex and all of its related site area within the resource area . . . remained until at least August of 1996." In fact, it remains to date. In her article, "Theodore Schwamb and the Era of the German Mills in Arlington, Arlington resident Grace Dingee, mill historian and a member of the Schwamb Mill Preservation Trust, notes, "[t]he fact that such buildings (at 1165-1167 Massachusetts Avenue) still exist is to the credit of the Mirak family . . ."

The attached documents: (a) information obtained from the Massachusetts Cultural Resource Information System; (b) information as to the Theodore Schwamb mill; (c) the above-referenced article by Grace Dingee, mill historian and member of the Schwamb Mill Preservation Trust; and (d) a photograph from the above-referenced article by Ms. Dingee, establish that the former Theodore Schwamb Company included both 1165 and 1167 Massachusetts Avenue and support an RDA that the Property constitutes a Historic Mill Complex.

- *What land is to be included in the footprint of the "Historic Mill Complex".*

Bohler Engineering has marked up the plan to show the Property to be utilized for the proposed development. The plan indicates in red the areas the applicant maintains is as a matter of fact and law part of the Historic Mill Complex.

A suggestion has been made that a 1923 map which is undated, unrecorded and not stamped, establishes that the parking field could not have been utilized in connection with the mill use because Mill Brook split the area in question. That map is not dispositive of the issue.

With respect to the comment made that the parking field could not have been used in connection with the mill activities because the 1923 map shows the Mill Brook being split with an island in its center, the Applicant has found several subsequent plans, which were prepared by surveyors and recorded with the Middlesex South Registry of Deeds, which clearly establish that

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even if the 1923 map were accurate, the condition (Mill Brook being split by an island), did not exist after 1927.

In the attached 1927 plan, Mill Brook is neither split nor is there an island on the plan. There is an obvious easement, perhaps a sewer easement, running on the north side of the Mill Brook. There also appears to be an entrance off what is now Ryder Street toward the mill complex.

The 1939 plan, which is attached, is not dispositive on this issue as the plan does not show Mill Brook to Ryder Street. The 1939 plan does clearly show the mill complex buildings and sewer easement.

The attached plan dated September 13, 1945 is critical in defining what the Applicant respectfully suggests the Commission may rely on to determine the footprint of the Historic Mill Complex. The plan shows the property line extending out to Ryder Street, which is clearly a driveway entrance to the mill complex. As such, it is to be considered interrelated to the mill use. Of importance, the plan shows the "Mill Brook Conduit" which is confined by stone walls as it still is today. The Applicant states that this is clear and definitive proof of Mill Brook's extent just before 1946 and clearly evidences the fact that Mill Brook was not split with an island in its center.

The Applicant states that based on the irrefutable evidence, even if Mill Brook was "split" as of 1923, as of September 13, 1945, and likely as of 1927, it was manipulated into its present "armored stone wall" configuration.

The enclosed current plan prepared by the Applicant's site civil engineer, Bohler Engineering, distinguishes the areas the Applicant asserts are part of the Historic Mill Complex (area in red) from area the Applicant believes is not included in the Historic Mill Complex as defined in the regulation (area in green).¹

Accordingly, the Applicant requests that the Commission act favorably on the pending RDAs.

¹ The small area referred to as lot 8D or "0 Ryder Street" on the 2019 plan enclosed was initially part of the overall mill lot. Some years after the acquisition of the property by John Mirak, the area was divided and deeded to the neighboring landowner, who subsequently deeded it back to the Applicant. Given its location, directly abutting Mill Brook and the rear mill building (see plan 110 of 2019 enclosed), this area clearly was associated with the Historic Mill Complex use.

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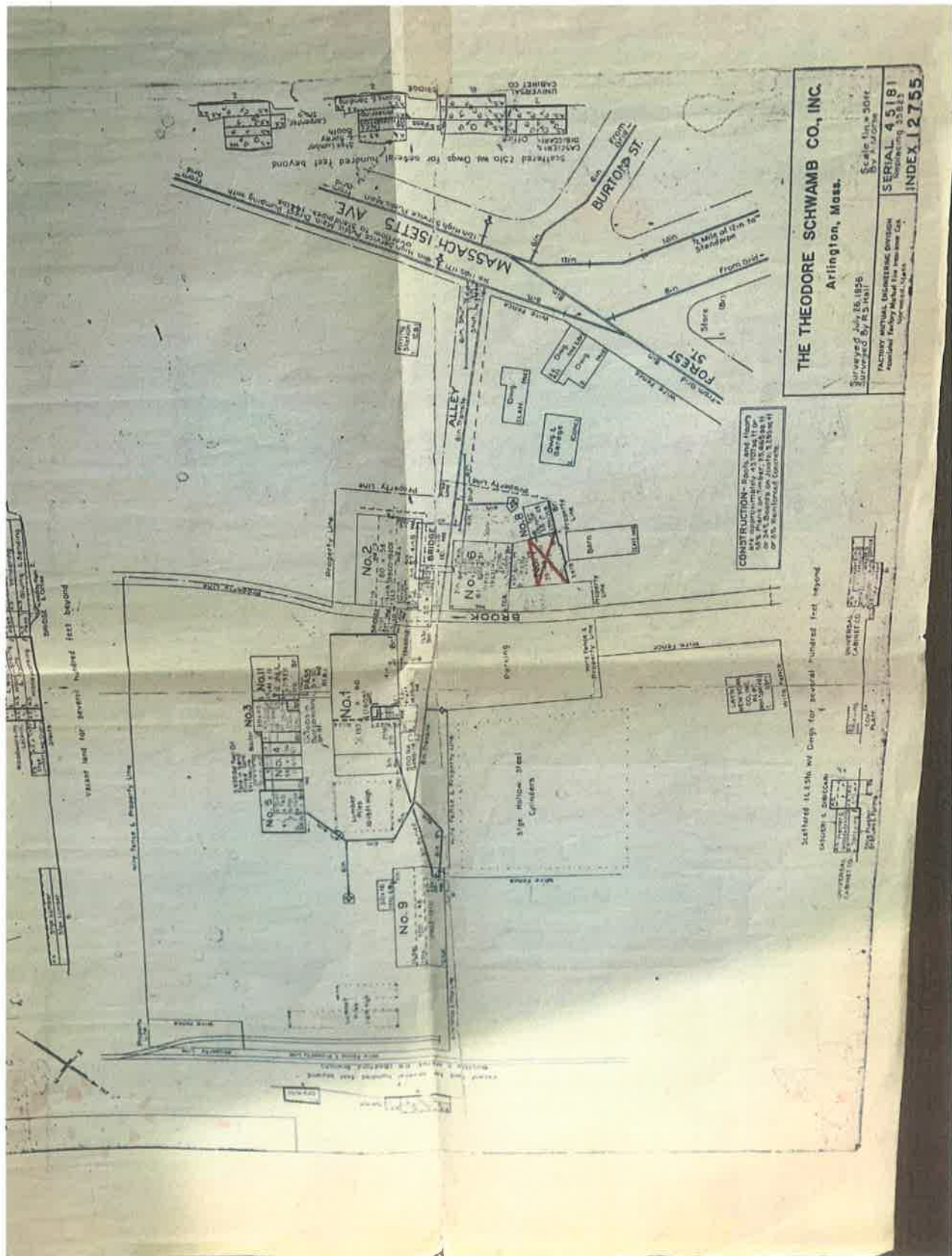
Susan Chapnick, Chairperson
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In advance, I thank you.

Very truly yours,

Mary Winstanley O'Connor

MWO/ccg
Enclosures
6926



Massachusetts Cultural Resource Information System

Scanned Record Cover Page

Inventory No: ARL.621
Historic Name: Schwamb, Theodore Piano Manufacturing Company
Common Name: Arlington Center Garage and Service Warehouse
Address: 1165 Massachusetts Ave

City/Town: Arlington
Village/Neighborhood: Arlington Heights
Local No: 319, 546
Year Constructed: r 1905
Architect(s):
Architectural Style(s): No style
Use(s): Abandoned or Vacant; Furniture Factory; Industrial Complex or District; Other Industrial; Warehouse
Significance: Architecture; Industry
Area(s):
Designation(s):
Building Materials(s): Wall: Aluminum Siding; Brick; Wood



The Massachusetts Historical Commission (MHC) has converted this paper record to digital format as part of ongoing projects to scan records of the Inventory of Historic Assets of the Commonwealth and National Register of Historic Places nominations for Massachusetts. Efforts are ongoing and not all inventory or National Register records related to this resource may be available in digital format at this time.

The MACRIS database and scanned files are highly dynamic; new information is added daily and both database records and related scanned files may be updated as new information is incorporated into MHC files. Users should note that there may be a considerable lag time between the receipt of new or updated records by MHC and the appearance of related information in MACRIS. Users should also note that not all source materials for the MACRIS database are made available as scanned images. Users may consult the records, files and maps available in MHC's public research area at its offices at the State Archives Building, 220 Morrissey Boulevard, Boston, open M-F, 9-5.

Users of this digital material acknowledge that they have read and understood the MACRIS Information and Disclaimer (<http://mhc-macris.net/macrisdisclaimer.htm>)

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Commonwealth of Massachusetts
Massachusetts Historical Commission
220 Morrissey Boulevard, Boston, Massachusetts 02125
www.sec.state.ma.us/mhc

This file was accessed on: Thursday, September 3, 2020 at 2:34: PM

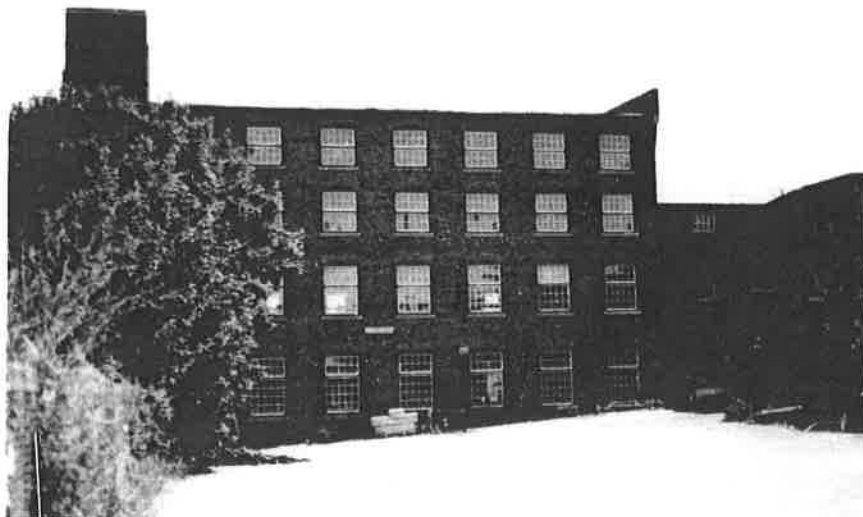
FORM B - BUILDING

MASSACHUSETTS HISTORICAL COMMISSION
Office of the Secretary, State House, Boston

In Area no.

Form no.

317



Town Arlington

Address 1165 Massachusetts Avenue

Name Theodore Schwank Co.

Present use None at present, but car lot surrounds most of building

Present owner John Mirak

Description:

Date 1905 - latest + largest wing original date not known yet.

Source Story of Arlington Source Material

Style _____

Architect _____

Exterior wall fabric brick/red aluminum siding

Outbuildings (describe) _____

Other features _____

Altered _____ Date _____

Moved _____ Date _____

5. Lot size:

One acre or less _____ Over one acre ☒

Approximate frontage 16' (right of way)

Approximate distance of building from street

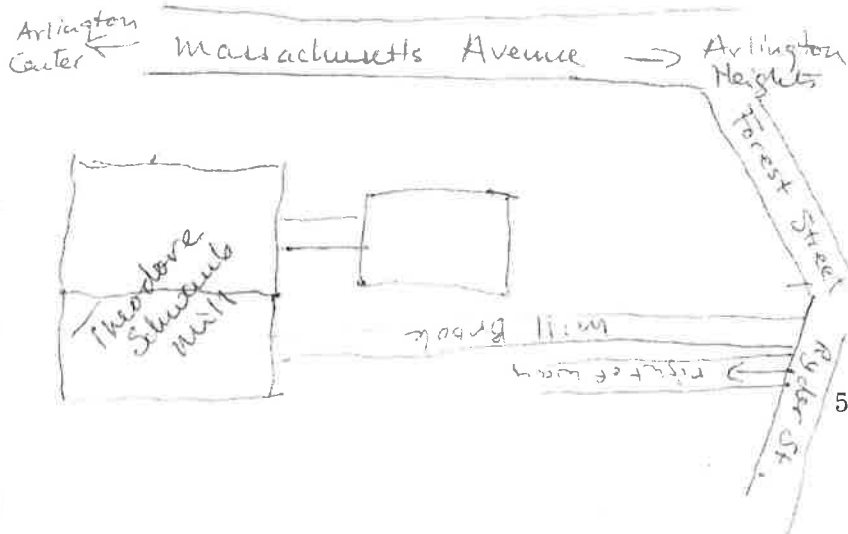
170'

6. Recorded by John Herzan

Organization Arlington Hist. Commission

Date June 5, 1973

4. Map. Draw sketch of building location in relation to nearest cross streets and other buildings. Indicate north.



DO NOT WRITE IN THIS SPACE
USGS Quadrant _____

MHC Photo no. _____

(over)

JUN 27 1973

44 of 342

7. Original owner (if known) probably Gershon Cutter

Original use turning and grinding edge tools

Subsequent uses (if any) and dates _____

8. Themes (check as many as applicable)

Aboriginal	_____	Conservation	_____	Recreation	_____
Agricultural	_____	Education	_____	Religion	_____
Architectural	<input checked="" type="checkbox"/>	Exploration/	_____	Science/	_____
The Arts	_____	settlement	_____	invention	_____
Commerce	_____	Industry	<input checked="" type="checkbox"/>	Social/	_____
Communication	_____	Military	_____	humanitarian	_____
Community development	_____	Political	_____	Transportation	_____

9. Historical significance (include explanation of themes checked above)

See attachments.

10. Bibliography and/or references (such as local histories, deeds, assessor's records, early maps, etc.)

Story of Arlington, Source Material, Arlington Public Schools
 1940. " " "
 1959. " " "

Theodore Schwamb Company

Gershom Cutter, who died in 1807, probably erected a mill on this privilege for turning and grinding edge tools, where his son Aaron Cutter had a mill previous to 1817. Jefferson Cutter, son of Aaron, a wood-turner, operated this mill for years. The next owner was Paul Dodge.

In 1848 Charles Schwamb came to this town and apprenticed himself to Paul F. Dodge. Later he went into business with Mr. Dodge. Two years later Peter Schwamb arrived and learned his trade of his brother Charles and Mr. Dodge. In 1853 Theodore and Jacob Schwamb entered into the partnership. In 1858 Frederick arrived and joined his brothers. This partnership dissolved in 1862.

Theodore Schwamb purchased the so-called Stephen Cutter mill buildings in 1871 and began the manufacture of piano cases. His business consisted of the manufacture of high grade pianos only, and therefore acquired a reputation of reliable and honest work. In 1885 the upright piano began to supersede the square so Mr. Schwamb installed machinery to enable him to produce cases in great numbers.

In 1897 the business was incorporated as the Theodore Schwamb Company with Theodore Schwamb as President, his son, Peter, Treasurer, and his nephew, Philip Eberhardt, Superintendent. In 1905 in order to meet demands of increased business the company erected a modern four-story brick building. A few years later the company gradually gave up the manufacture of upright cases and made an increasing number of grand cases. In the early days most of the employees were German cabinet makers. The company holds the remarkable record, in that since its incorporation it has never had a strike or shut-down on account of labor questions.

Theodore, Peter Schwamb and Philip Eberhardt are all dead and the mill has been divided into several small establishments although the estate of Philip Eberhardt still runs a section of the plant under the old name, Theodore Schwamb Company.

Charles Schwamb's Mill

In 1865 Charles and Frederick Schwamb purchased the Woodbridge Spice Mill on Lowell Street and began the manufacture of black walnut oval picture frames. Later Frederick moved to Chicago and Charles continued alone. Some years later Carl William joined his father in conducting the business and the name changed to Charles Schwamb and Son. This firm was well known throughout the country as reliable manufacturers of oval picture frames. The business became a very prosperous one, and these frames could be found in almost every American home.

About 1879 the use of oval frames went out of style and the square frames were used almost exclusively. Charles Schwamb then began the manufacture of straight mouldings and square frames. For a short time he turned out the mill work for the piano case business conducted by William P. Schwamb, son of Jacob. After the death of Charles in 1903 the business was conducted by his son, Carl William, and later taken over by his two sons, Clinton W. and Louis H. Schwamb

men and brought wealth to the town. Finally in 1885, the factory closed. All of the equipment was sold and moved away. More and more it seemed as though Arlington was not to be a manufacturing town.

Theodore Schwamb Company

There were five Schwamb brothers who came to this country from Germany.

In 1848 Charles Schwamb came to this town and apprenticed himself to Paul F. Dodge who was a wood-turner. He went into business with Mr. Dodge. Years later Peter Schwamb arrived and learned his trade with his brother Charles and Mr. Dodge. In 1853 Theodore and Jacob Schwamb entered into the partnership. In 1858 Frederick arrived and joined his brothers. This partnership dissolved in 1862. In this year Theodore Schwamb began the manufacture of piano cases.

At first these cases were for the square pianos used in those days. Later the upright piano became popular, and so Mr. Schwamb had to install machinery to make these in great numbers.

In 1897 the business was known as the Theodore Schwamb Company with Theodore Schwamb as President, his son, Peter, Treasurer, and his nephew, Philip Eberhardt, Superintendent. In 1905 in order to meet demands of increased business the company erected a modern four-story brick building. A few years later the company gradually gave up the manufacture of upright cases and made only grand piano cases. In the early days most of the employees were German cabinet makers.

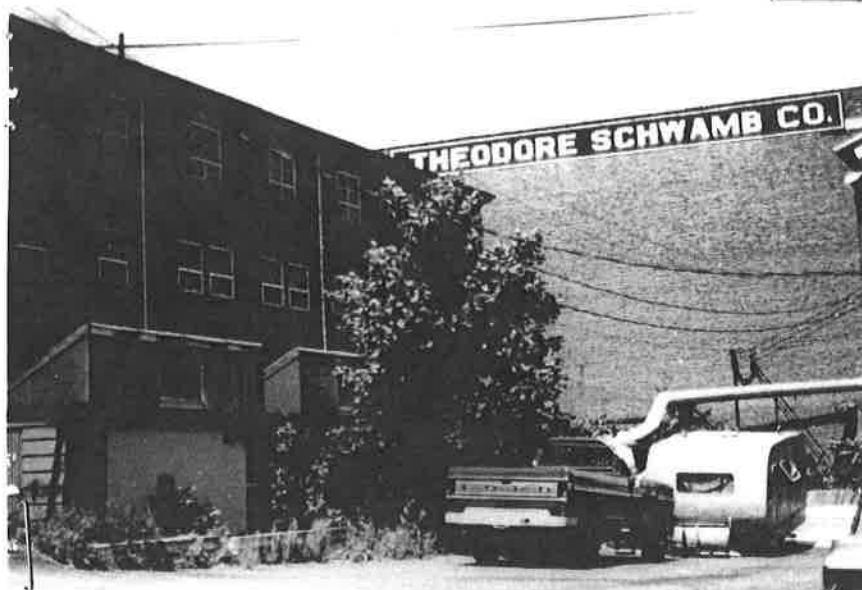
Around 1920, radios began to be very popular. As more and more of them were brought into the homes, fewer pianos were bought by families. For a time, the pianocase business was at a stand-still.

It was during these years that the Theodore Schwamb Company turned to another kind of wood-work called Architectural Woodwork. This means the door frames, base-boards, and all other kinds of finished woodwork in homes and buildings. As a matter of fact the woodwork at the Brackett School and High School was

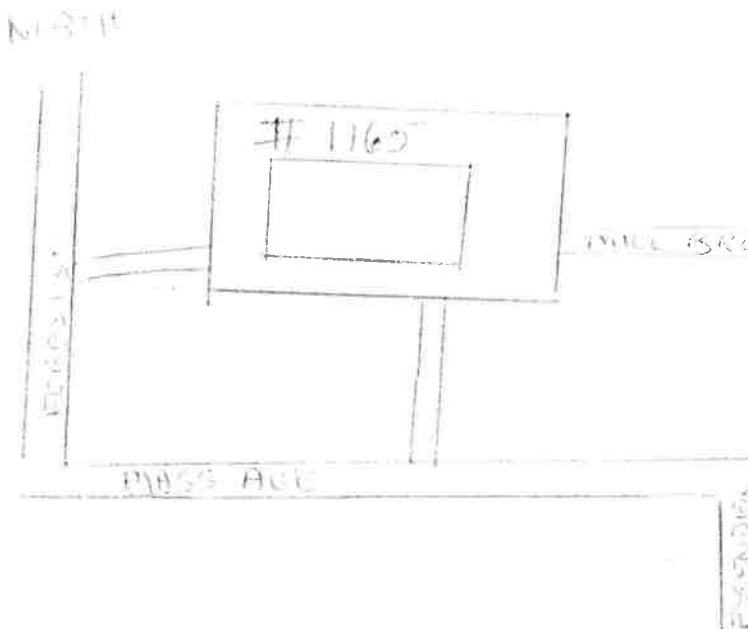
FORM B - BUILDING

MASSACHUSETTS HISTORICAL COMMISSION
204 Washington Street Boston MA 02108

Area	Form no.
	546



Draw map showing property's location in relation to nearest cross streets and other buildings or geographical features. Indicate north.



Recorded by P. & D. Hagar; M. Cohn
Organization Arl. Hist. Comm.
Date 1980

Arlington

1165 Massachusetts Avenue

ic Name Theodore Schwamb Co.

Original Factory

Present Storage

Ship: ☒ Private individual

Private organization

Public

Original owner Th. Schwamb Co.

DESCRIPTION:

Date 19th century

Source Parker's History of Arlington

Style Factory

Architect

Exterior wall fabric Brick

Outbuildings None

Major alterations (with dates) 20th century additions.

Moved No Date

Approx. acreage 22,572 sq ft

Setting Commercial

ARCHITECTURAL SIGNIFICANCE (describe important architectural features and evaluate in terms of other buildings within community)

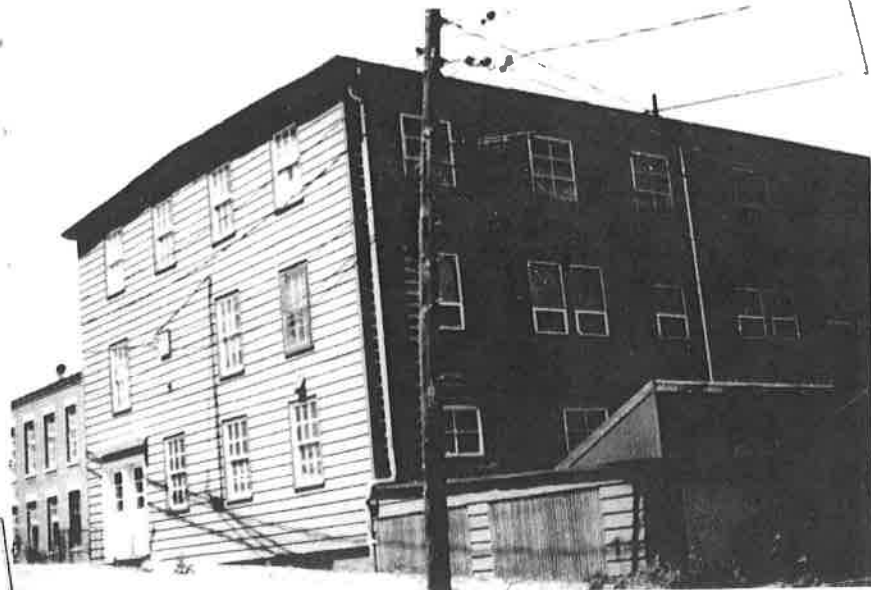
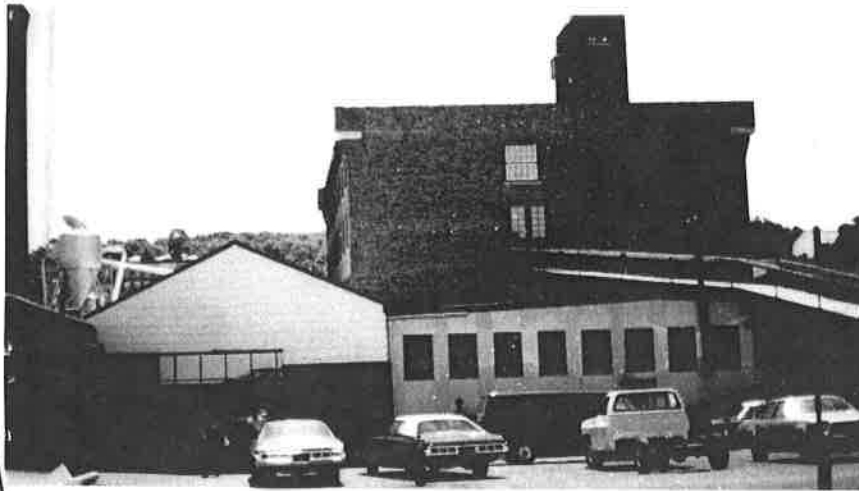
This large complex of well-built and carefully maintained mill buildings remains suitable for commercial or civic uses, although it is at present vacant or leased in small portions for business uses. Mills have stood at this site on the brook from the late 18th c.

HISTORICAL SIGNIFICANCE (explain the role owners played in local or state history and how the building relates to the development of the community)

BIBLIOGRAPHY and/or REFERENCES

Parker's History of Arlington

ASSESSORS RECORDS



THEODORE SCHWAMB MILL

Theodore Schwamb (1832-1902) immigrated to West Cambridge in 1853 to join his four brothers in the Paul Dodge woodworking mill. After Charles and Frederick left Dodge to form their own picture frame company, Theodore expanded his piano forte case business elsewhere along Mill Brook before buying the Dodge mill in 1871. Over the next three decades, his company added a railway siding, wood kiln, steam boiler, bridge and brick factory buildings, some of which still exist on the property. The Theodore Schwamb Company was incorporated in 1897, employed nearly 100 workers from many countries, and was one of Arlington's biggest concerns.

Theodore's son, Peter Schwamb, an MIT professor and director of the company, died in 1928, bringing an end to Schwamb family ownership. The Nickerson family acquired the Theodore Schwamb Company and operated it under the same name. They converted the factory from piano case making to the creation of interior woodwork for large buildings such as churches. The well-known firm of Cascieri di Biccari, specializing in wood carving, also operated from these buildings.

1800 Gershom Cutter IV builds a mill for grinding edge tools.

1830s Paul F. Dodge buys the mill and begins a business in wood-turning, sawing and piano hardware.

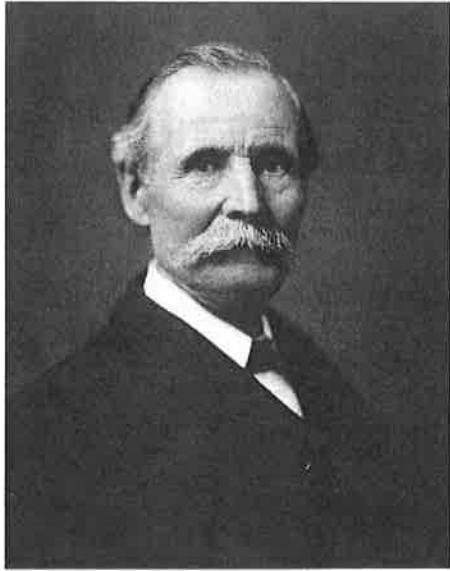
1848 Charles Schwamb begins his career in woodworking and soon enters into business with Paul Dodge. Over the next ten years, brothers Theodore, Peter, Jacob and Frederick Schwamb enter the partnership.

1871 Theodore Schwamb buys the Paul Dodge mill and expands the plant and workforce for his successful piano case business.

1931 The Theodore Schwamb Company is sold to the Nickerson family, and Cascieri di Biccari wood carvers rent some of the space.

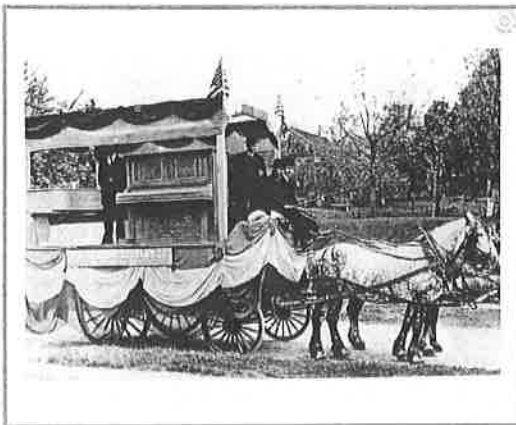
1972 The woodworking business at the mill is closed, and the site is acquired by John P. Mirak, who maintains and rehabilitates the former mill structures.

2018 Mirak Innovation Park (rental space for artists and small businesses)



Theodore Schwamb

Courtesy of the Schwamb Mill Preservation Trust, Inc.



Pianos of the Theodore Schwamb Company on display during Arlington's Centennial Parade in 1907.

*Arlington Historical Photograph Collection.
Courtesy of Arlington Historical Society.*

TEXT VERSION:

THEODORE SCHWAMB & THE ERA OF THE GERMAN MILLS IN ARLINGTON*By Grace Dingee, Mill Historian and Board Member*

In 1838, Jacob Schwamb emigrated to Boston from Untenheim, Rhein Hessen, Germany. Jacob was the first of the Schwamb brothers to emigrate to the United States. By 1857, six of the seven Schwamb brothers had emigrated from Rhineland Pfalz to the United States.

In their heyday, nine separate mills, each with one or two backup mill ponds, dotted the Mill Brook Valley along Massachusetts Avenue from East Lexington as far as Mystic Street in Arlington. The water of the Mill Brook was used by each mill wheel in turn, and the water was then passed on to the next. After 1872 the mills were forced to gradually convert to steam when the Arlington Heights residential plan was laid out and the town dug a reservoir on Lowell Street, in anticipation of the professional class expected to populate the Heights. The influx was not realized because a prolonged recession cut demand and the Arlington Land Company went bankrupt within two years. Complaints were also lodged that the water was not clean. In 1898, Arlington applied to join the Metropolitan water system and in 1899, its petition was granted. Thus, the Heights were able to escape the fate of having the waters of the Great Meadows flow into their sinks.

None of this, however, reversed the draining down of the Great Meadows due to the reservoir. Gradually, the mill ponds lost their vital importance, were drained, filled in or left to grass over; and the great era of the mills was over. The last pond to go, Fowle's Pond near Mystic Street, was still visible in about 1955. Luckily, the town was able use the old mill areas for sports playing fields, particularly at the High School and at Buzzell field. Writing in 1924, Jacob Bitzer noted that, of the nine mills, only four were still running. Only two mills were prosperous enough to run full-time. These belonged to the frame maker and grandson of Charles Schwamb, Clinton W. Schwamb, and to the Theodore Schwamb Company, which at this time focused its business on wooden cases for grand pianos. Bucking the trend of the mills to shut down, these two would continue to work profitably for almost another 50 years, until 1969 and 1972, respectively.

When 17-year-old Karl Schwamb came from the southern Rheinland to apprentice at the sawing and wood-turning firm of Paul F. Dodge at 1175 Mass. Avenue, Yankee names dominated the town. There were Lockes, Winships, Robbinses and, above all, Cutters. The mill barns behind the Dodge house were known as the Stephen Cutter Mill, and the site of the new house built by Dodge came from the Cutter heirs. Similarly, if Karl had stayed in his hometown, Uнденheim, he would have belonged to an equally large clan of Schwambs. The Schwambs were as ubiquitous in Uнденheim as the Cutters were in Arlington. What both families shared was energy and a desire to have their own mills.

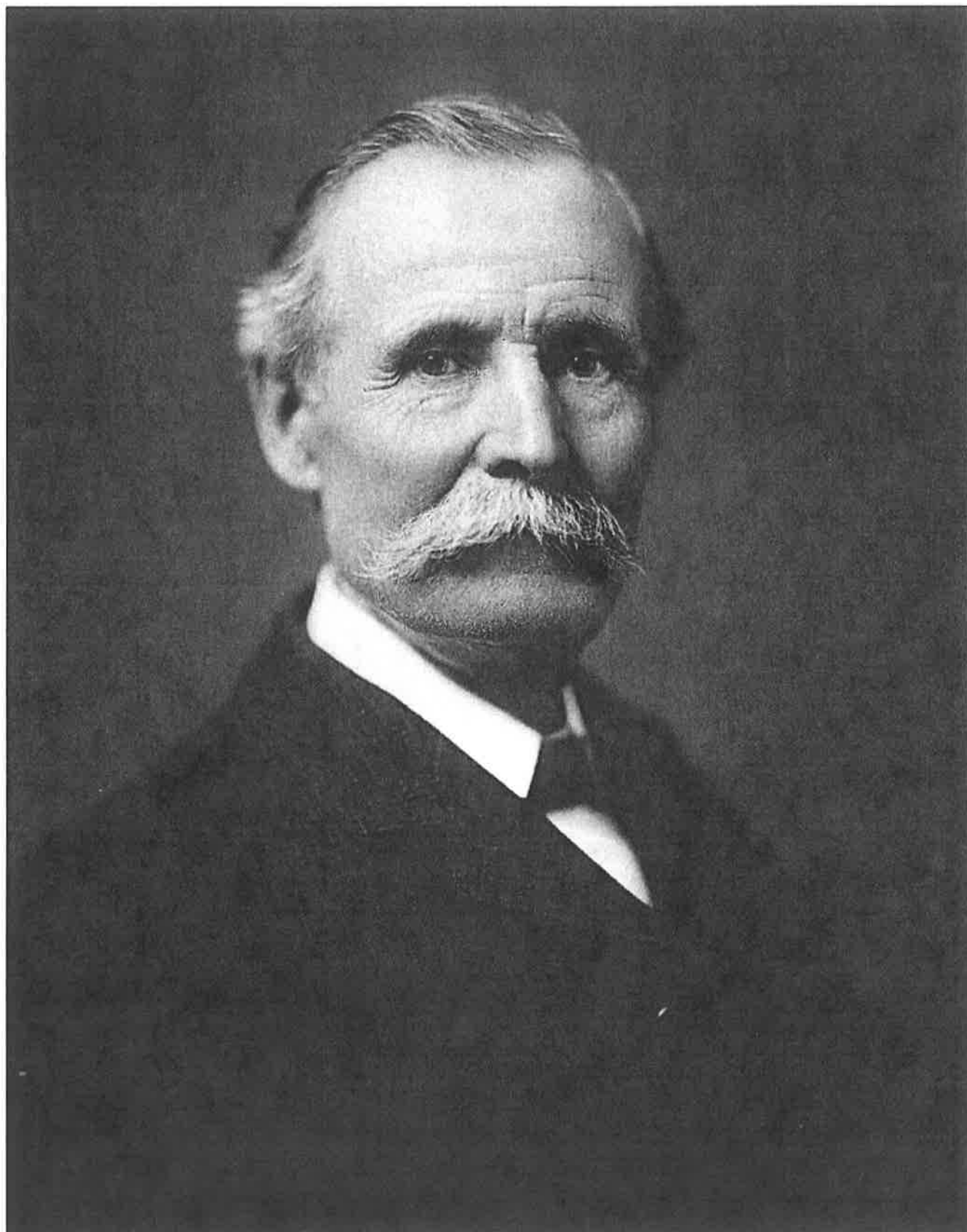
When he took on young Karl Schwamb as an apprentice, Dodge had suffered grievous personal losses: In 1836 he lost a son, age two months. In April, 1838, his wife, Maria Perry, died; and finally, his remaining infant son, age seven months, died in August of 1838. There is evidence that Dodge talked early to Charles about wanting to divest himself of the business. Half a century later, Karl Schwamb, renamed Charles Schwamb, consistently stated in his ads that his firm dated to 1850. This was likely the date when Dodge agreed to divestment. We know that the five Schwamb brothers' collaborative firm at this location began only in 1853, when the eldest brother, Jacob, was the first to join Charles in Arlington after several years of making piano cases for the firm of J.C. Lane in Leominster. Brother Peter had arrived in 1850 at age 20 to apprentice. In 1853, Theodore, then age 21, arrived from the vineyards he had tended for several years at his father's new, enlarged farm and public house in Kongenheim. He joined the elder brothers in a joint venture, which would last nine years until 1862. In 1857 the youngest and

last brother, Frederick, arrived in New York City from Le Havre on the ship, *Princeton*, accompanied by his fiancée, Thekla Breivogel. Five days later Thekla and Frederick were married in the Zion Evangelical Lutheran Church of Boston's South End, an early Greek revival brick building with classic pediment, which Jacob co-founded and helped to dedicate on Christmas Day, 1847.

As the first German to arrive in 1838, Jacob maintained his connection with the Zion Lutheran Church he helped to found, often "supplying the pulpit" himself in the absence of the minister. By 1853, however, he had begun to think better of settling on the scantily filled lands and commercial wharves of narrow Boston Neck. He had already buried two wives due to illness. He had worked in several piano factories in Boston and after 1842 had lived during an unhappy time of recession when his nearest brother, Ludwig, arrived to apprentice in woodworking, was forced to work in a lead-paint factory and fell ill with typhoid fever as well as lead poisoning. After a return to Germany, Ludwig reappeared in Boston in 1849, but passed through quickly, as if shaking the dust of Boston from his feet. He headed west to do what he had always wanted to do, to farm — first in Indiana and later in Missouri.

Perhaps also, Jacob found Leominster too undeveloped for a boy from the Rheinland. His foray there could have influenced his decision to join his brothers at 1171 Massachusetts Avenue in West Cambridge, a name Arlington retained until 1867. This was a proper town, yet with large tracts of undivided land, particularly in the Heights. The terrain was rougher for farming here than on the fertile eastern plain. But it was attractive for residences and businesses. In the coming decades, the Schwambs bought several of these areas from their Yankee owners. Jacob remarried again after two years, in 1855, to Katherine Guething. The couple added five more children to Jacob's previous five; and the good Katherine had the grace to outlive Jacob by six years and, with two of her sons, to continue until her death in 1887 the piano-case and straight-molding business Jacob had established at 1033 Mass. Avenue. The story of Jacob's mill didn't end there either: Jacob's youngest sons, William and Edward, carried on a furniture repairing and refinishing business together at 1033 Massachusetts Avenue until 1903, the year of William's death. As late as 1926, *The Arlington Advocate* reported that Edward Schwamb was still running the furniture refinishing business in the same place. And a jolly side of Edward came out in his obituary in 1946 when he died at 84. He was characterized as a notable musician who led the music program for the town's Centennial Celebration in 1907 and was the leader of the Arlington Zouaves Band. The Zouave soldiers were originally Civil War regiments with colorful costumes meant to resemble Berber tribesmen. Naturally, the story of Jacob's offspring doesn't end with the childless Edward. It is included to show the endurance, even of the least known of the Schwamb Mills, and the love of making music that ran through the German population in general, and the Schwambs in particular.

The business that the brothers started in 1853 was called, "Charles Schwamb and Brothers." This underlined the role of Charles as organizer. Jacob pioneered by scouting territory and pinpointing piano production as a skill with a future: Now Charles saw strength in numbers for the immigrant brothers and launched the enterprise. The location at 1171 Mass. Avenue had an attractive house, two hams and a mill wheel. During the firm's nine years of operation, the younger brothers apprenticed, became journeymen and joined the partnership. After the partnership was dissolved in 1862, the brothers started three separate businesses. Jacob, ever the restless family member, located himself in West Medford to make organ-cases for home use, a product of Mason and Hamlin Company. At the end of his career, Jacob returned to Arlington at 1033 Mass. Avenue where he ran his own mill until his death in 1881.



Theodore Schwamb

Theodore set his course to acquire 1171 Mass Avenue. It is not clear why he first located for a few years at 1093 Mass. Avenue near Hobbs Mill. He was determined to continue in the piano-case business and his eye was on the original location. By 1871 he was back at the Dodge homestead and had also acquired the Stephen Cutter Mill behind the house. Here, the largest of the three German mills in Arlington grew, the firm of Theodore Schwamb Company destined to last one hundred ten years and to remain important as the first and central location. The brothers all worked and lived close to one another for the rest of their lives, lending a hand in crises, and investing heavily in locations near one another in the Heights section of Arlington.

Sometime around 1850, Charles met Jane Sophia Hinton in the Choir of the First Parish Congregational Church (now Unitarian Universalist) in Arlington Center. Jane had been born in Birmingham, England. In 1852, Charles married his Jane and became the only brother to marry a girl with a non-German name. In this large, close-knit German family, one hopes that Jane managed to understand some German. Although Charles continued to walk often to Boston to attend services in German at Zion Lutheran Church in the South End, he was eager to become American as soon as possible; and an English-speaking wife fitted this plan.

A tragic event occurred in the brothers' collaboration in 1858, when a younger brother, Peter, died on March 24. We do not know the cause, but he had married Clara Buecher, an immigrant from Graach, Rheinpreussen, only one year earlier and his first child, Peter, Jr., was only one-and-one-half months old at the time of his father's death, suggesting a sudden and unexpected event.

Two years later, in 1860, Theodore married Peter's widow and adopted Peter, Jr., showing a trait he would carry through his life—the instinct of a good administrator to bring people together for the greater good of the whole. Charles, who was imaginative as an innovator, did not have the same ability to integrate his personnel. In 1864, for instance, Charles and Frederick opened a niche business on Mill Lane just a short distance upstream from the Dodge location. The Woodbridge Spice Mill had come up for sale after a fire. Here Charles and Frederick installed their lathes and introduced a new technology directed at the thriving market clamoring for oval frames: The business was successful, yet Frederick remained only three years, leaving with his wife Thekla Breivogel for New York State, and ultimately for Blue Island, Illinois, a suburb of Chicago. It was as if Charles instilled his spirit of adventure in others, but not in a manner that was to his own advantage.

The new wooden oval lathes offered technology capable of turning out perfect ovals of all sizes in large numbers, requiring skilled workmanship especially in the final contouring with a hand chisel on the double-axis lathe. The whole system was still powered by water. The enormous waterwheel, 18 feet in diameter was partially recessed under the basement floor, allowing for an "overshot" wheel, which channeled the water over the top. This was all going on, right under the feet of the workmen. Accustomed as we are to contemporary power sources, it is hard to believe this sophisticated shaping and carving was still deriving its energy from rough water flowing over a submerged wooden wheel. It had been so for thousands of years. But it seems somehow incongruous in the context of the burgeoning industrial age of the 1860s.

A similar example of Theodore's approach occurred in 1882. A plea came from Peter's nephew, Philip Eberhardt, in Guntersblum, Germany. Philip's mother, Katarina, was Theodore's sister, who died when Philip was only three. Philip suffered abuse from the husband of a kindly aunt, with whom he now lived. He begged his uncle in a letter to be allowed to come to the States. When Philip's ship arrived in New York, he was met by a Geunan customer of Theodore. But when he arrived in Providence on shipboard to Boston and could no longer hear German but only the "barbaric" English, he fell to weeping: "I was the most homesick boy you ever saw," he wrote many years later. "I laid my head on

the rail of the boat and cried my heart out. An old gentleman came and spoke to me but I cried all the harder until a young man who could speak German spoke to me and sort of straightened me out. I could not go into my stateroom but slept in one of the large chairs in the saloon. The next morning I arrived in Boston and was met by my sister and Mrs. Theodore Schwamb. On the following day, June 17th, I went to work and have been working ever since." For the first two years in Arlington, he remembered thinking that he would have returned immediately to Gettysburg if he could have. Nevertheless, he prospered at Theodore Schwamb, becoming superintendent of the entire plant in 1890, and then partner and director of the corporation in 1897. At Peter's retirement in 1924 Philip Eberhardt became president of the Theodore Schwamb Company. He continued to work there, even after the company was bought out by the Nickerson family in 1931, until the onset of his fatal illness shortly before his death in 1938.

Theodore's great talent for attracting and keeping talent was especially strong within his larger family. After Theodore's only son by Clara died at the age of two in 1866, Theodore set his hopes on his adopted son, Peter, Jr. Peter became, one might say, a perfect adopted son. He completed M.I.T. and rose there to become a professor of Mechanical Design and Mill Engineering, and head of the M.I.T. Mechanical Laboratories. Moreover, in Peter, Theodore had a son who could enhance his own profile in civic affairs, particularly in the 1890s, when Peter served on the committees to build two of Arlington's three most beautiful schools, the old High School on Academy Street, now the Senior Center; and the Cutter and Locke schools, placed at strategic intervals along Massachusetts Avenue as far as Park Avenue in the Heights. For the planning of the Locke, Peter was Committee Chairman. Presumably due to the really outstanding aesthetic of their architecture, and their solid construction, these schools were saved from the wrecker's ball and even though they were threatened at times in the years when school divestment was the fashion, the premise being that the school-age population would continue to decline. In 1899 also, Peter Schwamb, a long-time member of the Arlington Water Commission, was, in the words of William Cutter, "instrumental in having the town admitted into the Metropolitan water system." He remained active at Theodore Schwamb Company and joined in its incorporation as Treasurer in 1897. After Theodore's death in 1909, Peter took early retirement from M.I.T. and worked even more closely with the company until his own retirement in 1924.

While Theodore Schwamb built his company slowly, Charles leapt ahead quickly. From 1864 to 1879, Theodore's expansion was slower than Charles's. In 1878, for instance, when the bulk of the Mill owners were awarded damages for the drastic curtailment of the waters of the Sucker Brook due to the excavation of the Heights Reservoir, Theodore received \$6,024.16. Charles Schwamb, on the other hand, still riding the crest of the vastly popular oval frame business, received \$11,587.58. In 1875, *The Arlington Advocate* noted that Charles Schwamb had acquired "a snug fortune" in his business. In October of that year, he organized a surprise party among his thirty-five mill workers to welcome his twentyone-year-old son, Carl William, into his business as a partner. "The men in the establishment last Friday evening, despite the unfavorable state of the weather, marched in a body to the residence of Mr. Schwamb to congratulate the new firm." The "residence" was an impressive new mansard-roof house, which Charles had recently constructed at what is now 22 Fessenden Street. What Carl William, an artistic young man, thought of joining a dusty business (it was apparent later that his lungs were delicate), is a good question. But if he had to choose sawdust, rather than music, nevertheless, he remained a dutiful son and partner in the firm. He was the only son available at that time. When his only brother, Herbert Page, reached maturity 11 years later, he chose to go west to Denver. Within these limitations, Carl and his parents seemed to understand one another. He served as alternate organist, not only at the First Baptist Church where the family worshipped, but at various churches in the Heights and in Lexington. He was pianist for many years for the Sunday school of the First Baptist; and he designed music curriculum for the Arlington schools. Carl William died at the relatively early age, of 57 in 1912; yet for many decades thereafter a harpsichord stood on the third floor of the Mill as a reminder. In gratitude for Carl William's

contributions to the First Baptist Church in Arlington Center, the parish gave him an intricately carved square piano, an instrument which has been lovingly restored in the family of his granddaughter, Dorothy Sweet Raman, of Macomb, Illinois.

In 1879, the market for oval frames collapsed as square frames became the fashion. To the array of modern equipment Charles already had — rotary planers, band saws, circular saws and jigsaws, boring machines used for dowelling, and common and eccentric turning lathes — he now installed a molding machine, capable of being set to finish any possible design for straight stock, and to fashion any contour a frame maker might want. An enlarged second floor was added to accommodate the long lengths of stock. Charles was also helped with orders subcontracted from his brother, Jacob, who had for several years been operating in his own Mill at 1033 Mass. Avenue next to the building that is today Stop and Shop Pharmacy. (Not until 1919 did this parcel go out of Schwamb hands, when it was sold to a manufacturer of electric repair parts, and carbon and metal brushes used in automobiles. *The Advocate* reported that “The building is of the olden time construction and the timbers are put together with wooden pins, heavy timbers being used and many of them, quite a contrast to the buildings of today”. In recent years, several nostalgic mill enthusiasts have looked for this treasure, only to leave again cursing the brick-cube apartment building which has replaced it.)

In the early 1890s, America experienced a severe economic panic, followed by a prolonged recession. It is therefore surprising to read that the Theodore Schwamb Company saw constant growth, both in the 1890s and in the first years of the new century. In 1898, the year after its incorporation, the Company was the largest single business in Arlington. Directors were Peter Schwamb, Treasurer, Philip Eberhardt, Clerk and Assistant Superintendent, and Jacob Bitzer, Head of the shop. New property was purchased behind the Mill in 1905. In the same year, a narrow-gauge spur railroad track was added, linking the firm to the railroad and enabling the company to receive and deliver almost in the manner of a private railroad. Among the new structures, the largest was the four-story brick building, which today still bears uppermost on its facade the words, THEODORE SCHWAMB CO., ready for the passers-by of the twenty-first century.

As the middle class began to upscale its musical tastes in the new century, the vogue for upright pianos gave way to the aspiration for a grand piano. Theodore Schwamb Co. followed the trend, which required not only skill but speed and coordination in gluing veneers to its fine hardwoods. As the new century dawned, however, the first generation seemed suddenly to have grown quite venerable. At Charles Schwamb and Son Co., the heir apparent, Carl William, was on a protracted stay in Denver to improve his health. At the Mill, shop superintendent, John Frederick Bitzer, oldest brother of Jacob Bitzer, carried on as he had for 36 years. One cannot see how much sales work could have been going on.

For Charles, by nature an energetic entrepreneur, looking back from the vantage of 1900 must have been daunting. Of the nine children born to him and to Jane Hinton, seven were dead. Two sons and a daughter died shortly after birth; but the unthinkable happened from 1884 to 1891. His four grown daughters, lovely young women if one may judge from their photos, all died, one after another in successive years. Evidence strongly suggests a family tendency to tuberculosis, though the only written evidence concerns their youngest daughter, Jennie Louise Schwamb Wyman, who had recently given birth to a daughter. Two weakening bouts of pneumonia are mentioned, one before and one after the baby's birth (the baby also died within a few months). When Charles Schwamb died in 1903 at the age of seventy-six, his faithful superintendent, John Frederick Bitzer, resigned immediately and joined his youngest brother, Jacob Bitzer, at Theodore Schwamb, where he remained for the rest of his professional life.

When Carl William returned from Denver he found the mill almost without business and he retired in 1905. This is the point at which the Schwamb energy sprang up again: his two sons, Clinton W., 26, and Louis, 19, suddenly acquired a frantic determination to save their Mill. In 1907, under the new name of "Clinton W. Schwamb and Co.," they hoisted the red, white and blue bunting to the Mill's facade for the Centennial Celebration of the town's independent status. Under the company's name were emblazoned the words, "OLDEST OVAL FRAMEMAKER IN NEW ENGLAND." The firm was old—the partners were young! Clinton and Louis were not shy about invoking antecedents, if it served their purpose. The entrepreneur knows how to pick himself up because risks involve falls, and entrepreneurship is risky. Over years of hard work, Clinton and Louis brought the Mill back to prosperity.

Clinton's son, Elmer Schwamb, was born in 1904. When talking to Patricia Fitzmaurice in earlier years, Elmer remembered how hard his father and uncle worked to save and restore the Mill; and how he himself entered the business in the 1920s, traveling the length the East Coast on sales trips. The Mill stayed profitable and Elmer even added a niche partnership called "Elwayne," involving his son Wayne for the production of specialty frames. In the end, it was the advent of molded plastic and the ever-worsening quality of lumber that forced Elmer Schwamb, after the death of his Uncle Louis, in 1967, and that of Clinton in 1968, to sell what was to become the Old Schwamb Mill.

The buyer had plans to raze the building and blacktop the lot for parking. But luckily Patricia Fitzmaurice, who was already an ardent preservationist, happened by on her bicycle one fall day and learned the plans. She saw the historic exterior, and even more surprising, the incredible array of period tools and machines within. With the help of a small group of concerned Arlingtonians, she started the process that would result in the creation of a working museum, the Old Schwamb Mill, now in operation for 35 years.

Theodore Schwamb died in 1909. The piano-case business began to lag with the increasing interest in recordings, and especially with the advent of the radio in the early 1920s. Peter Schwamb retired in favor of Philip Eberhardt in 1924 and died unexpectedly in 1928 in the midst of his family at his house at 33 Academy Street. When Philip Eberhardt sold the business to the Nickerson family in 1931, the company name of Theodore Schwamb was retained. A decision was made to switch products to high-end architectural woodworking. This was a felicitous decision, given the extensive interior areas available and the skills, particularly of Italian workers, in the area. During the next forty-plus years, the Theodore Schwamb Co. became known nationwide for large projects of interior wood paneling and woodcarving.

Their work included elaborate projects for Yale University in New Haven; for the Tryon Palace at New Bern, North Carolina; for the original John Hancock Building in Boston and at the Harvey Firestone Library at Princeton, N.J. The firm of Cascieri di Biccari (the late Archangelo Cascieri, Dean of the Boston Architectural Center and Adio di Biccari, Arlington sculptor) opened a studio at Theodore Schwamb. Over four decades, this firm produced a wealth of carving and sculpture, including the exquisite Cascieri carvings for Marsh Chapel at Boston University; and the di Biccari sculpture ensemble opposite West Street on the Boston Common. One photo, taken in Arlington at the Schwamb Studio in the 1950s, shows a giant sculpture of St. Clement. The ponderous saint lies prone on a truck, having made it through of the wide doors of the Schwambs' most attractive structure, a small, classic brick building with brick detail, a building still extant today at 1167 behind the old homestead. After arriving safely at his Brighton destination, St. Clement was hoisted to very top of the facade of St. John Seminary.

The fact that such buildings still exist is to the credit of the Mirak family, a long-time Arlington family whose firm has specialized since 1936 in dealerships and service of cars and trucks. Recently, the firm developed a residential complex in Arlington Center called "The Legacy." Robert Mirak recently commented that "when my father, John Mirak, purchased the property in the 1970s, some of his

colleagues suggested tearing down the buildings to make way for another dealership or a major shopping center. My father decided to keep the buildings and used the property to store excess auto inventory. In addition, he liked the looks of the buildings and especially the handsome red brick and the colonial windows. From that time to the present, my father and in succession, the family has upgraded the buildings. Inside, over the decades, we have upgraded floors and brickwork. Specifically, the original wood flooring, which was blackened by use, was cleaned, sanded and urethaned to a handsome finish. Also, a number of walls were sandblasted to remove the paint on the brick; the results were sparkling.”

At this Theodore Schwamb complex, it is gratifying to see how many small businesses have found a home: the Image Inn has run a photographic studio there since 1982, specializing in the rare skills and patience required by traditional techniques; the architectural firm of Rovinelli is upstairs at 1167; and there are many individual artists in residence at the large complex at 1165, as well as the new WorkBar, established in 2016.

The Charles Schwamb Mill at 17 Mill Lane did not grow as large as the Theodore Schwamb Company, and it was never as visible, either. But however much the market fluctuated, Charles Schwamb and his descendants never gave up making fine oval frames. Amidst the final commercial years of competition from inferior wood and plastics, the Mill continued this work, as it does today, thanks to the late Patricia Fitzmaurice and her supporters.

In the end, the Old Schwamb Mill can lay claim to having endured, both as living history and as a working Mill. All three brothers, Theodore and Charles and Jacob, could be proud that their generation of immigrants achieved so much that is still treasured in Arlington today.

TIMELINE of the Schwamb Mill & Mill Brook

1630 English Puritan colonists first settled in Cambridge, Massachusetts in 1630 during the thirty years of the Great Migration. They brought with them, from England, the waterpower mill technology that was implemented on Mill Brook in Arlington for 235 years (after which a steam turbine replaced the water wheel). The Mill Brook, which drops more than 150 feet in two miles through Arlington, powered mills of various kinds at seven to nine mill sites. The brook has been called successively Vine Brook, Sucker Brook, and Mill Brook. According to one local historian (Edith Winn), the brook was a “mighty rushing river” at the end of the last ice age.

1637 The first mill on the Brook in Menotomy, or the Northwest Precinct of Cambridge (now Arlington), was the earliest water powered gristmill within the limits of colonial Cambridge. It was financed by Dr. Samuel Read of England and was established in 1637 by Captain George Cooke (b. c. 1610; d. Apr 1652) near the present day location of the Community Safety Building on Mystic Street in Arlington. Cooke’s Mill is now commemorated by a park, Cooke’s Hollow, and a bronze tablet.

1638 Edward Winship bought a three-acre estate at the easterly corner of Brattle and Mason Streets and extending through the Cambridge Common (in Cambridge). He was a Lieutenant of Militia in 1660, a Selectman for 14 years between 1637 and 1684, and a Representative in the General court for eight years. He died on 2 Dec 1688.

Cooke had sailed for New England in the ship Defence in 1635, at the age of 25. In Massachusetts, on 3 Mar 1636, he was admitted as a freeman. From there he became a representative in its Assembly, and Speaker in 1645. In addition, he had been appointed Captain of the Artillery Company in 1637 and once returned to Boston with nine Indians captured during an “excursion”.

1639 The Squaw Sachem (i.e. woman chief) of the Massachuset (<http://dickshovel.com/massa.html>) tribe ceded all the lands of her tribe, excepting her homestead (which was bounded on the east by the Mystic Lakes and on the south by Mill Brook), to the English Puritan settlers of Cambridge, for “twenty and one coates, ninten fathom of wampom, and three bushels of corne”. Three epidemics of European diseases and warfare with the Abenaki (<http://www.dickshovel.com/aben.html>) tribe from the north had greatly reduced the number of men in the Massachuset tribe. The survivors were too few to defend their land against the invaders from England and had little choice but to agree to the contract. The Squaw Sachem (whose name is unknown) died in 1658. The exchange of property is illustrated in two local WPA murals: *Purchase of Land from the Indians* by Aidan Lasell Ripley, 1934, in the Winchester MA Public Library, and *Purchase and Use of the Soil* by William A. Palmer, 1938, in the Arlington MA Post Office.

Many of the principal inhabitants of Wexford as well as several hundred females gathered around the great cross in the marketplace of Wexford in the hope that their defenseless condition would move George Cooke and his men to compassion. However, Cooke butchered all of them and filled the marketplace with their blood.

1645 Captain George Cooke abandoned his mill, returned to England, and joined Cromwell’s army as Colonel of a regiment of foot soldiers. Puritan “Roundheads” formed the backbone of Cromwell’s forces. On 11 Oct 1649, Cooke’s regiment captured the town of Wexford (in County Wexford, Ireland). Cooke became governor and “exacted bloody retribution against the defending Irish”. Houses and cabins, and stores of livestock and corn were all plundered and burnt. Cooke insisted that this was the only way to subdue the roving parties of Irish, by denying them sustenance and shelter in the region.

Dr. Lynch describes George Cooke, the commander of the Puritans in Wexford, as especially remarkable for his brutality and cruelty. Having given a security to the inhabitants of Wexford that they might reside in their own homes, “Cooke afterwards authorized Captain Bolton, before the extirpation of the stipulated day, to scour that county with his cavalry and plunder it. Then commenced an indiscriminate massacre of men, women, and children, by which not less than four thousand souls, young and old, were atrociously butchered.”

In 1652, General Cooke shut up 300 men and many infants in a house in the county of Wexford, and then setting fire to the house, all were burned in the flames. But Captain Gore, one of the officers under Cooke, succeeded in concealing on his horse, under his cloak, a little boy who had escaped out of the house. Cooke, discovering the fact, severely condemned the captain, and returning himself with the boy, hurled him into the flames.

In April 1652, Cooke and his mounted escort had a running fight with the troop of the Irish patriot, Captain Nash, on the road from Gowran to Loughlin. Both Cooke and Captain Nash were found dead after the battle.

Cooke’s mill in Menotomy was allowed to decay and eventually crumble away.

1670 Cooke’s daughter Mary, then living in England, sold her father’s 600-acre farm at Cambridge Farms (now Lexington) as well as the twenty acres of land in Menotomy (now Arlington) to John Rolfe of Nantucket. (Ref. 7, page 235.) Rolfe erected an entirely new waterpowered mill on the old site.

1681 John Rolfe died. His widow, Mary (Scullard) Rolfe, sold a fifth of the Cooke farm at Cambridge Farms, or 120 acres of land. She and her son Moses laid out the second Mill Brook watermill power system of pond, dam, mill, and mill race at what is now Mill Street in Arlington. They first built a dam but then waited several years before completing the entire mill raceway system.

1684 The third watermill power system of ponds, dam, mill, and mill race had been laid out before 1684, and a mill built by David Winship, at the Foot of the Rocks in the Menotomy section of Cambridge. This is the site of the present Old Schwamb Mill.

This third mill privilege, at the Foot of the Rocks, was willed to Joseph Winship (b. 21 Jun 1661; d. 18 Sep 1725; resided in Menotomy) by his father, Lt. Edward Winship, who had also built mills in Lexington at the edge of the Great Meadow. Evidence of a mill pond is still visible as a grassy park near Bow Street.

1688 Lieutenant Edward Winship died on 2 Dec 1688 and left to his son Joseph "a certain gristmill in Cambridge, with all and singular the dam, flooms, mill-pond", etc. This mill was on the site of what is now called The Old Schwamb Mill.

1704 William Cutter built a dam 18 feet high near his home at the present Mill Street, raised the level of the pond, and erected a sawmill.

1714 Moses Rolfe, a son of John Rolfe, sold 130 acres of Cooke's farm to John Cutter (a glazier b.1690), a son of William Cutter.

1718 Moses Rolfe sold 100 acres of the Cooke's Farm to his brother-in-law, William Cutter, husband of Moses Rolfe's sister.

1732 On 27 Dec 1732, the General Court designated the part of Cambridge on the west side of the Menotomy River (now called Alewife Brook) as the Second or Northwest Precinct of Cambridge. This was the beginning of the First Congregational Parish, the parish being simply the precinct in its religious relations.

After several changes of name the First Congregational Parish eventually evolved into the First Parish Unitarian Universalist Church of Arlington.

1775 On the first day of the American Revolution, Paul Revere and the British regulars all passed at a distance of about 200 yards from the Mill at the Foot of the Rocks on their way to Lexington and Concord. The British returned by the same route, fighting their way through Menotomy on their way back to Charlestown.

1807 In 1807, Menotomy (which was officially called the Northwest or Second Parish of Cambridge) became a separate town, West Cambridge.

1808 In 1808, Stephen Cutter constructed another sawmill on the pond at Mill Street.

1827 In 1827, Mary Cutter, the widow of Stephen Cutter, granted land abutting the Mill Pond to the Baptist Society "for the erection of a meeting house with the privilege of using so much of the mill pond as necessary for the ordinance of baptism." Sylvia Brazy was baptized on 3 June 1827.

1838 Jacob Schwamb emigrated to Boston from Untenheim, Rhein Hessen, Germany. Jacob was the first of the Schwamb brothers to immigrate to the United States. By 1857, six of the seven Schwamb brothers had emigrated from Rhineland Pfalz to the United States.

1846 The Lexington and West Cambridge Rail Road commenced service between Bedford, Lexington, Arlington (then called West Cambridge), and Boston.

1847 Charles Schwamb emigrated to Boston from Uнденheim, Rhein Hessen, Germany to join his older brother Jacob in the burgeoning Boston piano industry.

1850 Charles and Jacob Schwamb moved to the Dodge Mill (built by Gershom Cutter) on Mill Brook (1167 Massachusetts Avenue) to make piano cases. They were joined by brothers Peter, Theodore, and Frederick.

1853 From 1853 to 1862, Charles, Jacob, Theodore, Peter, and Frederick Schwamb operated a collaborative piano-case business at 1165 Massachusetts Avenue in West Cambridge (now Arlington).

1858 Peter Schwamb died suddenly, leaving a widow and a two-month-old son, Peter Schwamb, Jr.

1860 Theodore Schwamb married the widow of his brother Peter. Theodore adopted Peter Jr. who would become a professor and Director of the Mechanical Laboratory at MIT and Treasurer of the Theodore Schwamb Company at 1165-1171 Massachusetts Avenue in Arlington.

After ownership of the Foot of the Rocks Mill property had descended through many generations, it was acquired by Henry Woodbridge for grinding spices. The mill was severely damaged by fire in 1860.

1861 The Woodbridge Spice Mill at the Foot of the Rocks was rebuilt on the old foundations circa 1861.

1862 Theodore Schwamb founded the Theodore Schwamb Mill to manufacture piano casings. The address later became 1165 Massachusetts Avenue in Arlington, Massachusetts.

Frederick shortly left for Chicago and the lumber business. Frederick and his wife (Thekla Breivogel) were living in New York State in 1871.

1864 Charles Schwamb and his youngest brother, Frederick, acquired the Woodbridge Spice Mill at the Foot of the Rocks. Using skills that they had developed in their native Germany and in their American apprenticeships, they converted the mill to woodworking, especially for making oval frames for portrait photographs. They installed shaft and pulley belt-driven machinery, including German eccentric faceplate lathes and a moulding machine. Four generations of descendants of Charles Schwamb operated the Mill until 1969.

Theodore Schwamb and Peter Schwamb acquired the Dodge Mill. Jacob Schwamb, the oldest of the Schwamb brothers, opened his own piano case business.

1865 The popularity of the oval portrait frame arose just after the Civil War along with the increasing accessibility of photography. Beginning then, the Old Schwamb Mill became the leading maker of hand-turned oval and circular portrait and mirror frames in the United States.

1867 In order to distinguish itself from its parent community and to honor its Civil War heroes, the town changed its name from West Cambridge to Arlington on 30 April 1867.

1869 A new three-story wing was added to the Old Schwamb Mill in 1869 to provide for a four-sided moulding machine on the first floor and finishing rooms above.

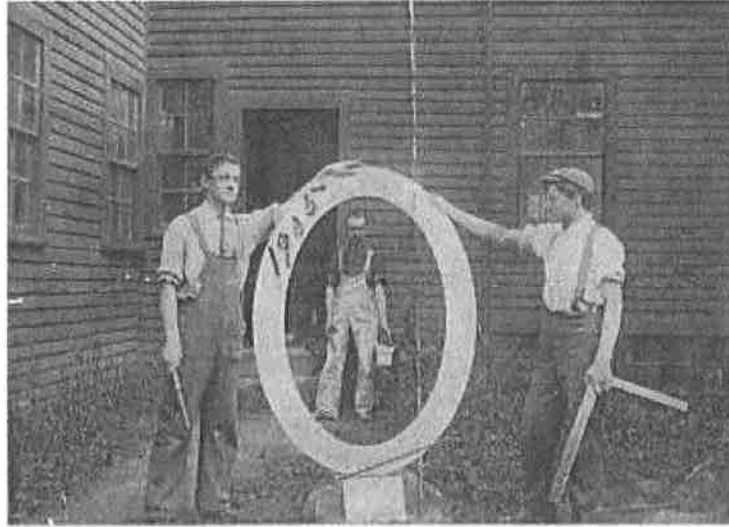
1872 The Town of Arlington took Mill Brook for a public water supply. The Charles Schwamb Mill at the Foot of the Rocks installed a steam engine in the cellar of the barn. A 40-foot-long underground drive shaft transmitted power to the Mill machinery.

1875 Charles's son Carl William (or "Will") was taken into partnership. Carl often played the organ at the First Baptist Church in Arlington. There is a report that Carl was the organist at the Follen Church (Unitarian) in Lexington.

1883 A two-story ell was added to the Mill in 1883 to provide a first-floor office and a shipping room above.

1888 A water turbine was added to the Charles Schwamb Mill at the Foot of the Rocks in 1888 to supplement the existing steam engine power.

1905 Carl's sons Clinton and Louis acquired the Mill property and business, which they named the Clinton W. Schwamb Company.



*In the
photo
above,
Clinton
is on the
left and
Louis is
on the
right. The
date
"1905"
was
written
by pencil
on the
print that
was
scanned,
not
written
on the
actual*

*wooden
frame.*

1922 The Theodore Schwamb Mill included seven buildings and had about 100 employees.

1928 A nephew of Theodore Schwamb assumed ownership of the Theodore Schwamb Mill. He discontinued manufacture of piano casings and began to manufacture architectural woodwork.

1931 The Theodore Schwamb Mill was reorganized by Donald E. Nickerson, Donald A. Davis, and Alvin W. Davis.

1940 The Theodore Schwamb Mill added an ecclesiastical department which included Arcangelo Cascieri as resident sculptor.

1942-1945 For the duration of World War II, the Theodore Schwamb Mill discontinued all civilian work. It produced millwork and cabinet work for military bases, Liberty ships, and PT boats.

1954 The Clinton W. Schwamb Mill installed electric motors and sold its steam engine. The original 19th century shaft and pulley belt-driven system remained in place to transmit power to the individual machines throughout the Mill.

1969 Deaths of Clinton and Louis Schwamb, and the approaching retirement of Clinton's son Elmer, prompted Elmer Schwamb and Louis's widow to enter into a purchase and sale agreement with neighboring lumber terminal truckers to honor Clinton's promise to the truckers to provide additional truck access to their property. The plan of the truckers called for demolition of the three Mill buildings.

The Schwamb Mill Preservation Trust, a nonprofit charitable educational trust, was formed by four Arlington Conservation Commission members:

Patricia C. Fitzmaurice (1923-2001)
Doris Atwater (now Bouwensch)
Rudolph Kass
David D. Wallace

The purpose of the Trust was — and is — to raise funds to save the Mill, to maintain the production of oval frames, and to exhibit the Mill's collections and traditions. This was apparently the first case of grassroots historic industrial preservation in America.

1970 On 16 Jan 1970, the Old Schwamb Mill was acquired by The Schwamb Mill Preservation Trust with contributed funds from two Boston foundations, a Cambridge bank, and several individual donors. The Trust appointed Patricia C. Fitzmaurice as Managing Trustee, a position which she held until her death on 15 Feb 2001.

During the years following the acquisition, frame makers working at the Mill included

- David Graf: Current woodturner
- David Hogan
- Walter Horak
- Ronald J. McLellan (15 May 1924-30 Dec 1995)
- Gordon E. Richardson (10 Aug 1902 — 23 Jan 1990)
- Gordon Whitermore.

After being acquired by the Schwamb Mill Preservation Trust, the Old Schwamb Mill continued to manufacture museum-quality frames but relied on the additional income that it received from donors and appropriate tenants.

In the summer of 1970, the Old Schwamb Mill created a Craft Center which offered 10-week courses in:
Silver Jewelry Making taught by *H. Val Fay*
Printmaking taught by *Anthony Pilla*
Pottery and Ceramics taught by *Nadine Hurst*
Clay Sculpture and Pottery taught by *Lisa McLean*
Furniture Refinishing taught by *Bron M. Warsaskas*
Waste Conversion taught by *Richard Darling*

In the autumn, the Mill added courses in Life Drawing, Water Color Painting, Italic Lettering, Gold Leafing, Furniture Stenciling, Weaving, Leathercraft, and Basic Oil Painting.

Part of the second story of the Mill was rented to The Hart Viol Workshop. The proprietor, Richard Hart, manufactured Viols da Gamba, Vielles, Psalteries, Rebecs, Fiedels, and other Mediterranean and Renaissance string instruments.

Two potteries were started at the Mill: the Barn Potters, Cora Pucci and Kathy Ingoldsby; and the Mill-Race Pottery with Telle Bjork and Nadine Hurst.

1971 The Theodore Schwamb Mill closed. That property was acquired by another immigrant entrepreneur, John P. Mirak, partially for use by his automobile dealership and partially for lease to numerous small businesses.

The Old Schwamb Mill was listed in The National Register of Historic Places by the Secretary of the United States Department of the Interior for the Mill's national historical significance.

1972 The Old Schwamb Mill held its first annual "barn sale." This fundraising event was continued for at least three years.

1975 The Old Schwamb Mill obtained the last remaining timbers from the "Washington Elm" (under which General George Washington assumed command of all colonial troops on 3 July 1775). The Mill manufactured for sale 75 spandrel frames using wood from the Washington Elm. Each frame contained a print showing Washington taking command of the Continental Army.

1976 At the request of the Commandant of the First Naval District, artisans from the Old Schwamb Mill made an oak jewel chest from timbers of the USS Constitution.

J. William Middendorf II, Secretary of the United States Navy, gave the chest to Queen Elizabeth II at the time of her bicentennial visit to Boston.

1979 Shaker Workshops became a tenant of the Old Schwamb Mill in May 1979. They occupied the westerly half of the first floor of the main Mill building.

The Mill offered classes in Design, Advance Calligraphy and Manuscript Illumination, Life Drawing, Painting, Silver Jewelry, Stained Glass, Pottery, Woodworking with Hand Tools, Woodworking in Miniature, and Researching Old Houses.

1981 Artisans of the Old Schwamb Mill produced 13 oval display cases as part of the renovation of the throne room in the Iolani Palace in Hawaii. The cases are being used to display the jewels which kings, queens, and emperors gave to the Hawaiian royalty during their travels covering a period of 15 years. Each case has an oval shape and has a royal crest at the top. The oval cases were carved out of seasoned poplar. The crests were carved out of maple from the town of Wellesley.

1983 In Dec 1983, Shaker Workshops expanded its operations. They established their office in the upper level of the barn and used the lower level of the barn for production. Their showroom remained in the main building of the Mill.

1985 Sometime in 1985, Shaker Workshops moved its production to Fitchburg and expanded its showroom at the Old Schwamb Mill to occupy both floors of the barn. By Jan 1986, they had moved completely out of the main Mill building.

1988 The Massachusetts Historical Commission gave a 25th Anniversary Preservation Award to Patricia C. FitzMaurice for her preservation activities in connection with the Old Schwamb Mill.

2000 On 17 May 2000, Patricia Fitzmaurice received the Ayer Award from the Bay State Historical League for being "a visionary preservationist who recognized the historical and educational value of the Old Schwamb Mill property in Arlington in 1969 and since then has worked tirelessly in leading efforts to fulfill its mission."

Today The site of The Old Schwamb Mill is now the oldest continuously operating mill site in the United States. The earlier mills are either long gone or no longer operating.

Schwamb frames and mouldings are in every major art museum in the United States and are included in the collections of the White House, the Vatican, Buckingham Palace, the Palace of the Kings of Hawaii, and the collection of Queen Sylvia of Sweden.

[WORDPRESS.COM.](https://oldschwambmill.org/schwamb-family/)

Theodore Schwamb and the Era of the German Mills in Arlington



MIRIAM BITZER SWEENEY

Jacob Bitzer, as a young man. He came from Germany at the age of ten.

In 1924, retired shop superintendent and director of the Theodore Schwamb Mill, Jacob Bitzer, recognized that almost all of the second-generation German mill owners had passed away. After his mill career, Bitzer was extraordinarily active in civic affairs, as Town Moderator, and as a member of the Massachusetts General Court. He was instrumental in building the new high school on Massachusetts Avenue in 1914, and pushing through the Mystic Valley Parkway. When he looked back and realized how much of the mill era had already vanished, he composed a "History of the Mills along the Sucker Brook," for the Arlington Historical Society. "Sucker Brook" was an earlier name for Arlington's Mill Brook, which ran and still runs, sometimes underground, from the Great Meadows in East Lexington, to the Mystic Lakes on the Winchester border.

In their heyday nine separate mills, each with one or two backup mill ponds, dotted the Mill Brook Valley along Massachusetts Avenue from East Lexington as far as Mystic Street in Arlington. The water of the Mill Brook was used by each mill wheel in turn, and the water was then passed on to the next. After 1872 the mills were forced to gradually convert to steam when the Arlington Heights residential plan was laid out and the town dug a reservoir on Lowell Street, in anticipation of the professional class expected to populate the Heights. The influx was not realized because a prolonged

recession cut demand and the Arlington Land Company went bankrupt within two years. Complaints were also lodged that the water was not clean. In 1898, Arlington applied to join the Metropolitan water system and in 1899, its petition was granted. Thus, the Heights were able to escape the fate of having the waters of the Great Meadows flow into their sinks.

None of this, however, reversed the draining down of the Great Meadows due to the reservoir. Gradually, the mill ponds lost their vital importance, were drained, filled in or left to grass over; and the great era of the mills was over. The last pond to go, Fowle's Pond near Mystic Street, was still visible in about 1955. Luckily, the town was able use the old mill areas for sports playing fields, particularly at the High School and at Buzzell field. Writing in 1924, Jacob Bitzer noted that, of the nine mills, only four were still running. Only two mills were prosperous enough to run full-time. These belonged to the frame maker and grandson of Charles Schwamb, Clinton W. Schwamb, and to the Theodore Schwamb Company, which at this time focused its business on wooden cases for grand pianos. Bucking the trend of the mills to shut down, these two would continue to work profitably for almost another 50 years, until 1969 and 1972, respectively.

When 17-year-old Karl Schwamb came from the southern Rheinland to apprentice at the sawing and wood-turning firm of Paul F. Dodge at 1175 Mass. Avenue, Yankee names dominated the town. There were Lockes,

Winships, Robbinses and, above all, Cutters. The mill barns behind the Dodge house were known as the Stephen Cutter Mill, and the site of the new house built by Dodge came from the Cutter heirs. Similarly, if Karl had stayed in his hometown, Undenheim, he would have belonged to an equally large clan of Schwambes. The Schwambes were as ubiquitous in Undenheim as the Cutters were in Arlington.

What both families shared was energy and a desire to have their own mills.

When he took on young Karl Schwamb as an apprentice, Dodge had suffered grievous personal losses: In 1836 he lost a son, age two months. In April, 1838, his wife, Maria Perry, died; and finally, his remaining infant son, age seven months, died in August of 1838. There is evidence that Dodge talked early to Charles about wanting to divest himself of the business. Half a century later, Karl Schwamb, renamed Charles Schwamb, consistently stated in his ads that his firm dated to 1850. This was likely the date when Dodge agreed to divestment. We know that the five Schwamb brothers' collaborative firm at this location began only in 1853, when the eldest brother, Jacob, was the first to join Charles in Arlington after several years of making piano cases for the firm of J.C. Lane in Leominster. Brother Peter had arrived in 1850 at age 20 to apprentice. In 1853, Theodore, then age 21, arrived from the vineyards he had tended for several years at his father's new, enlarged farm and public house in Köngernheim. He joined the elder brothers in a joint venture, which would last nine years until 1862. In 1857,



Today the Theodore Schwamb Mill complex houses a variety of small businesses

the youngest and last brother, Frederick, arrived in New York City from Le Havre on the ship, *Princeton*, accompanied by his fiancée, Thekla Breivogel. Five days later Thekla and Frederick were married in the Zion Evangelical Lutheran Church of Boston's South End, an early Greek revival brick building with classic pediment, which Jacob co-founded and helped to dedicate on Christmas Day, 1847.

As the first German to arrive in 1838, Jacob maintained his connection with the Zion Lutheran Church he helped to found, often "supplying the pulpit" himself in the absence of the minister. By 1853, however, he had begun to think better of settling on the scantily filled lands and commercial wharves of narrow Boston Neck. He had already buried two wives due to illness. He had worked in several piano factories in Boston and after 1842 had lived during an unhappy time of recession when his nearest brother, Ludwig, arrived to apprentice in woodworking, was forced to work in a lead-paint factory and fell ill with typhoid fever as well as lead poisoning. After a return to Germany, Ludwig reappeared in Boston in 1849, but passed through quickly, as if shaking the dust of Boston from his feet. He headed west to do what he had always wanted to do, to farm – first in Indiana and later in Missouri.

Perhaps also, Jacob found Leominster too undeveloped for a boy from the Rheinland. His foray there could have influenced his decision to join his brothers at 1171 Massachusetts Avenue in West Cambridge, a name Arlington retained until 1867. This was a proper town, yet with large tracts of undivided land, particularly in the Heights. The terrain was rougher for farming here than on the fertile eastern plain. But it was attractive for residences and businesses. In the coming decades, the Schwambs bought several of these areas from their Yankee owners. Jacob remarried again after two years, in 1855, to Katherine Guething. The couple added five more children to Jacob's previous five; and the good Katherine had the grace to outlive Jacob by six years and, with two of her sons, to continue until her death in 1887 the piano-case and straight-molding business Jacob had established at 1033 Mass. Avenue. The story of Jacob's mill didn't end there either: Jacob's youngest sons, William and Edward, carried on a furniture repairing and refinishing business together at 1033 Massachusetts Avenue until 1903, the year of William's death. As late as 1926, *The Advocate* reported that Edward Schwamb was still running the furniture refinishing business in the same place. And a jolly side of Edward came out in his obituary in 1946 when he died at 84. He was characterized as a notable musi-

cian who led the music program for the town's Centennial Celebration in 1907 and was the leader of the Arlington Zouaves Band. The Zouave soldiers were originally Civil War regiments with colorful costumes meant to resemble Berber tribesmen. Naturally, the story of Jacob's offspring doesn't end with the childless Edward. It is included to show the endurance, even of the least known of the Schwamb Mills, and the love of making music that ran through the German population in general, and the Schwambs in particular.

The business that the brothers started in 1853 was called, "Charles Schwamb and Brothers." This underlined the role of Charles as organizer. Jacob pioneered by scouting territory and pinpointing piano production as a skill with a future: Now Charles saw strength in numbers for the immigrant brothers and launched the enterprise. The location at 1171 Mass. Avenue had an attractive house, two barns and a mill wheel. During the firm's nine years of operation, the younger brothers apprenticed, became journeymen and joined the partnership.

After the partnership was dissolved in 1862, the brothers started three separate businesses. Jacob, ever the restless family member, located himself in West Medford to make organ-cases for home use, a product of Mason and Hamlin Company. At the end of his career, Jacob returned to Arlington at 1033 Mass. Avenue where he ran his own mill until his death in 1881.

Theodore set his course to acquire 1171 Mass Avenue. It is not clear why he first located for a few years at 1093 Mass. Avenue near Hobbs Mill. He was determined to continue in the piano-case business and his eye was on the original location. By 1871 he was back at the Dodge homestead and had also acquired the Stephen Cutter Mill behind the house. Here, the largest of the three German mills in Arlington grew, the firm of Theodore Schwamb Company destined to last one hundred ten years and to remain important as the first and central location. The brothers all worked and lived close to one another for the rest of their lives, lending a hand in crises, and investing heavily in locations near one another in the Heights section of Arlington.

Sometime around 1850, Charles met Jane Sophia Hinton in the Choir of the First Parish Congregational Church (now Unitarian Universalist) in Arlington Center. Jane had been born in Birmingham, England. In 1852, Charles married his Jane and became the only brother to marry a girl with a

Peter Schwamb, Jr., during his years as Professor of Machine Design and Mill Engineering at M.I.T.



non-German name. In this large, close-knit German family, one hopes that Jane managed to understand some German. Although Charles continued to walk often to Boston to attend services in German at Zion Lutheran Church in the South End, he was eager to become American as soon as possible; and an English-speaking wife fitted this plan.

A tragic event occurred in the brothers' collaboration in 1858, when a younger brother, Peter, died on March 24. We do not know the cause, but he had married Clara Buecher, an immigrant from Graach, Rheinpreussen, only one year earlier and his first child, Peter, Jr., was only one-and-one-half months old at the time of his father's death, suggesting a sudden and unexpected event. Two years later, in 1860, Theodore married Peter's widow and adopted Peter, Jr., showing a trait he would carry through his life – the instinct of a good administrator to bring people together for the greater good of the whole. Charles, who was imaginative as an innovator, did not have the same ability to integrate his personnel. In 1864, for instance, Charles and Frederick opened a niche business on Mill Lane just a short distance upstream from the Dodge location. The Woodbridge Spice Mill had come up for sale after a fire. Here Charles and Frederick installed their lathes and introduced a new technology directed at the thriving market clamoring for oval frames: The business was successful, yet Frederick remained only three years, leaving with his wife Thekla Breivogel for New York State, and ultimately for Blue Island, Illinois, a suburb of Chicago. It was as if Charles instilled his spirit of adventure in others, but not in a manner that was to his own advantage.

The new wooden oval lathes offered technology capable of turning out perfect ovals of all sizes in large numbers, requiring skilled workmanship

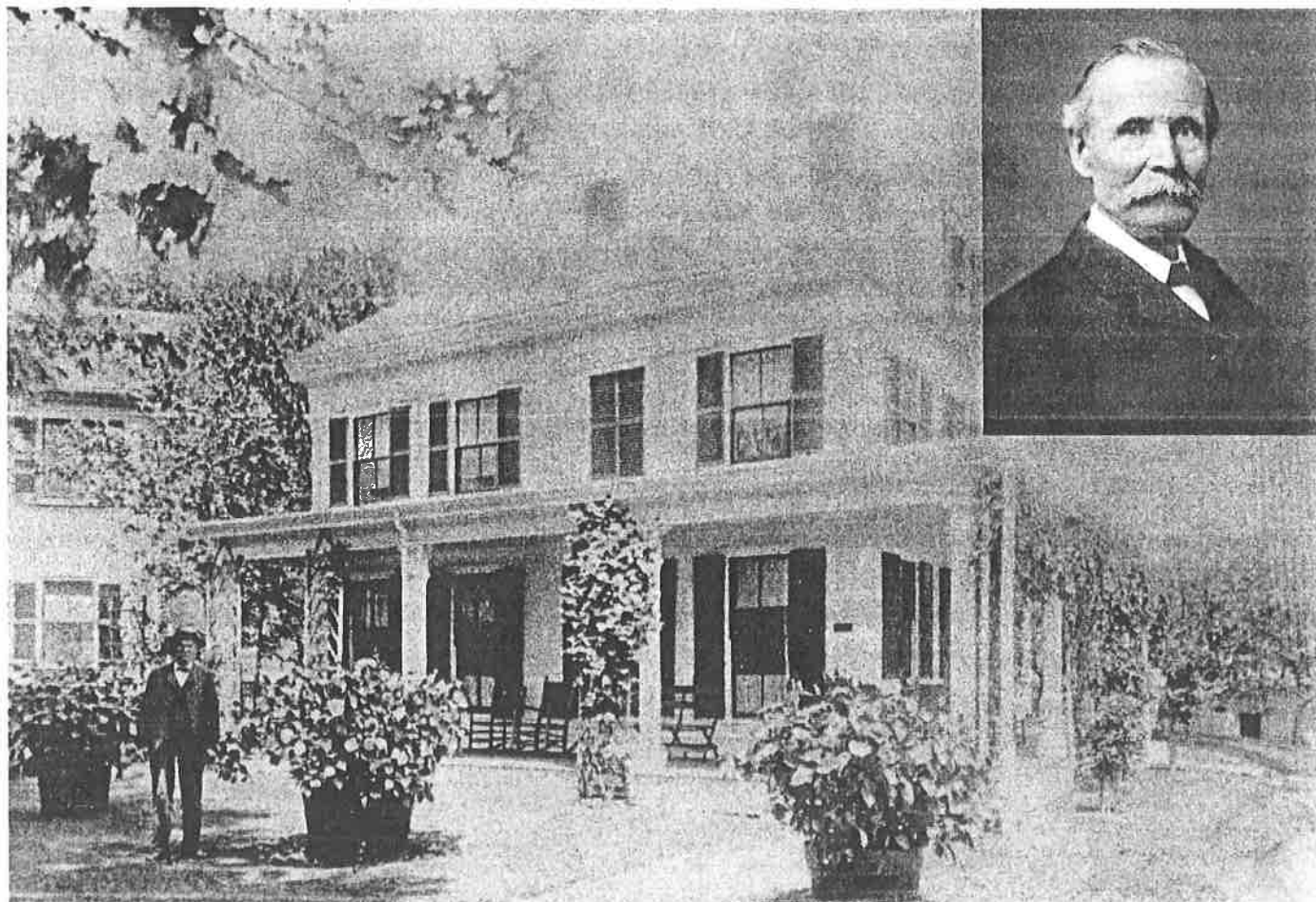
especially in the final contouring with a hand chisel on the double-axis lathe. The whole system was still powered by water. The enormous waterwheel, 18 feet in diameter was partially recessed under the basement floor, allowing for an "overshot" wheel, which channeled the water over the top. This was all going on, right under the feet of the workmen. Accustomed as we are to contemporary power sources, it is hard to believe this sophisticated shaping and carving was still deriving its energy from rough water flowing over a submerged wooden wheel. It had been so for thousands of years. But it seems somehow incongruous in the context of the burgeoning industrial age of the 1860s.

A similar example of Theodore's approach occurred in 1882. A plea came from Peter's nephew, Philip Eberhardt, in Guntersblum, Germany. Philip's mother, Katarina, was Theodore's sister, who died when Philip was only three. Philip suffered abuse from the husband of a kindly aunt, with whom he now lived. He begged his uncle in a letter to be allowed to come to the States. When Philip's ship arrived in New York, he was met by a German

customer of Theodore. But when he arrived in Providence on shipboard to Boston and could no longer hear German but only the "barbaric" English, he fell to weeping: "I was the most homesick boy you ever saw," he wrote many years later. "I laid my head on the rail of the boat and cried my heart out. An old gentleman came and spoke to me but I cried all the harder until a young man who could speak German spoke to me and sort of straightened me out. I could not go into my stateroom but slept in one of the large chairs in the saloon. The next morning I arrived in Boston and was met by my sister and Mrs. Theodore Schwamb. On the following day, June 17th, I went to work and have been working ever since." For the first two years in Arlington, he remembered thinking that he would have returned immediately to Germany if he could have. Nevertheless, he prospered at Theodore Schwamb, becoming superintendent of the entire plant in 1890, and then partner and director of the corporation in 1897. At Peter's retirement in 1924 Philip Eberhardt became president of the Theodore Schwamb Company. He continued to work there, even after the company was bought out by the Nickerson

family in 1931, until the onset of his fatal illness shortly before his death in 1938.

Theodore's great talent for attracting and keeping talent was especially strong within his larger family. After Theodore's only son by Clara died at the age of two in 1866, Theodore set his hopes on his adopted son, Peter, Jr. Peter became, one might say, a perfect adopted son. He completed M.I.T. and rose there to become a professor of Mechanical Design and Mill Engineering, and head of the M.I.T. Mechanical Laboratories. Moreover, in Peter, Theodore had a son who could enhance his own profile in civic affairs, particularly in the 1890s, when Peter served on the committees to build two of Arlington's three most beautiful schools, the old High School on Academy Street, now the Senior Center; and the Cutter and Locke schools, placed at strategic intervals along Massachusetts Avenue as far as Park Avenue in the Heights. For the planning of the Locke, Peter was Committee Chairman. Presumably due to the really outstanding aesthetic of their architecture, and their solid construction, these schools were saved from the wrecker's ball and have found a second life in new incarnations,



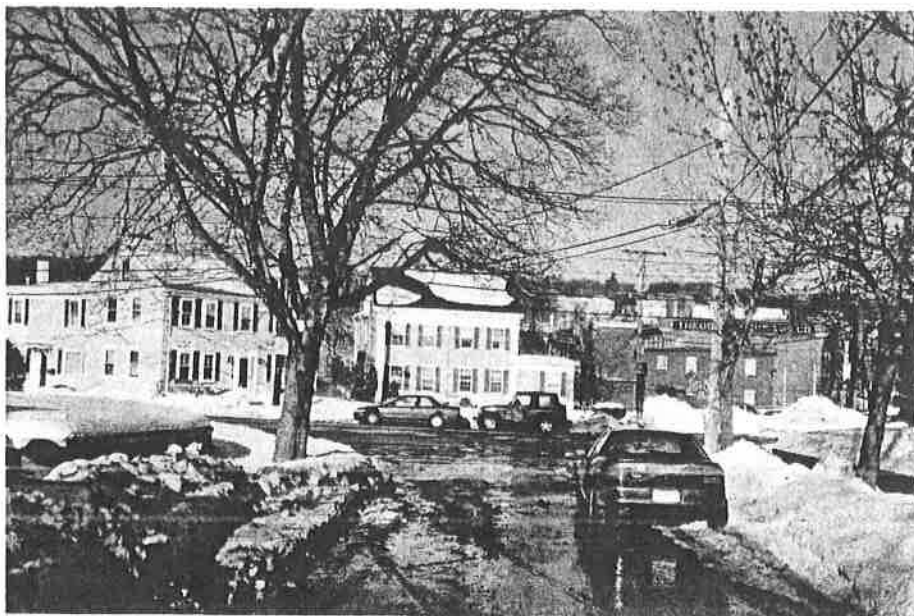
The Theodore Schwamb (formerly Dodge) homestead at 1171 Mass. Ave., about 1905. Theodore stands at left, bottom. Portrait of Theodore inset upper right. The showy landscaping reflects his early love of his father's vineyards in Germany.

even though they were threatened at times in the years when school divestment was the fashion, the premise being that the school-age population would continue to decline. In 1899 also, Peter Schwamb, a long-time member of the Arlington Water Commission, was, in the words of William Cutter, “instrumental in having the town admitted into the Metropolitan water system.” He remained active at Theodore Schwamb Company and joined in its incorporation as Treasurer in 1897.

After Theodore’s death in 1909, Peter took early retirement from M.I.T. and worked even more closely with the company until his own retirement in 1924.

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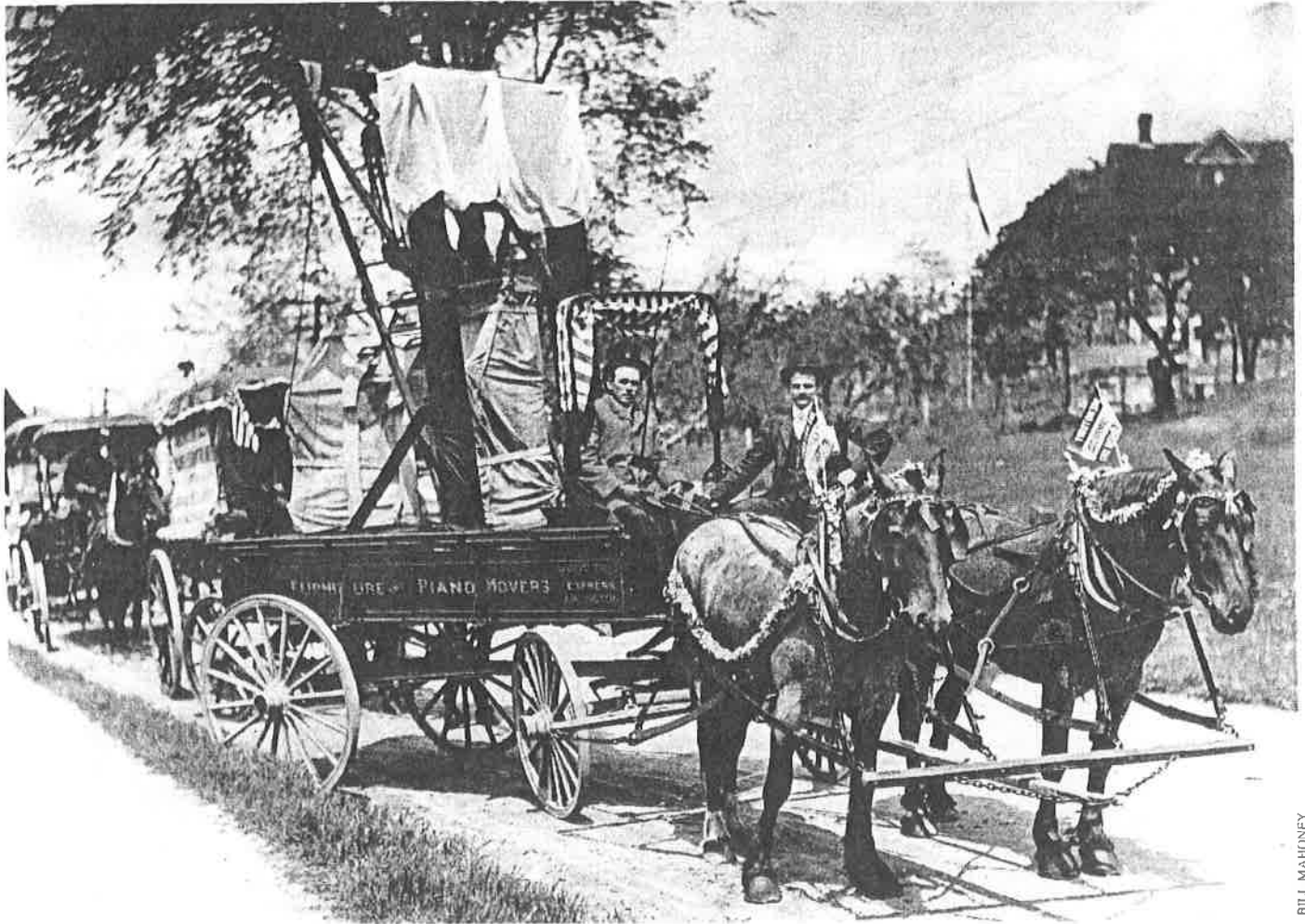
shop superintendent, John Frederick Bitzer, oldest brother of Jacob Bitzer, carried on as he had for 36 years. One cannot see how much sales work could have been going on.

For Charles, by nature an energetic entrepreneur, looking back from the vantage of 1900 must have been daunting. Of the nine children born to him and to Jane Hinton, seven were dead. Two sons and a daughter died shortly after birth; but the unthinkable happened from 1884 to 1891. His four grown daughters, lovely young women if one may judge from their photos, all died, one after another in successive years. Evidence strongly suggests a family tendency to tuberculosis, though the only written evidence concerns their youngest daughter, Jennie Louise Schwamb Wyman, who had recently given birth to a daughter. Two weakening bouts of pneumonia are mentioned, one before and one after the baby's birth (the baby also died within a few months). When Charles Schwamb died in 1903 at the age of seventy-six, his faithful superintendent, John

Frederick Bitzer, resigned immediately and joined his youngest brother, Jacob Bitzer, at Theodore Schwamb, where he remained for the rest of his professional life.

When Carl William returned from Denver he found the mill almost without business and he retired in 1905. This is the point at which the Schwamb energy sprang up again: his two sons, Clinton W., 26, and Louis, 19, suddenly acquired a frantic determination to save their Mill. In 1907 under the new name of "Clinton W. Schwamb and Co.," they hoisted the red, white and blue bunting to the Mill's facade for the Centennial Celebration of the town's independent status. Under the company's name were emblazoned the words, "OLDEST OVAL FRAMEMAKER IN NEW ENGLAND." The firm was old – the partners were young! Clinton and Louis were not shy about invoking antecedents, if it served their purpose. The entrepreneur knows how to pick himself up because risks involve falls, and entrepreneurship is risky. Over years of hard work, Clinton

and Louis brought the Mill back to prosperity. Clinton's son, Elmer Schwamb, was born in 1904 and is now 100 years old. He is living with his son, Wayne, in Fulton, Missouri. When talking to Patricia Fitzmaurice in earlier years, Elmer remembered how hard his father and uncle worked to save and restore the Mill; and how he himself entered the business in the 1920s, traveling the length the East Coast on sales trips. The Mill stayed profitable and Elmer even added a niche partnership called "Elwayne" involving his son Wayne for the production of specialty frames. In the end, it was the advent of molded plastic and the ever-worsening quality of lumber that forced Elmer Schwamb, after the death of his Uncle Louis, in 1967, and of Clinton in 1968, to sell what was to become the Old Schwamb Mill. The buyer had plans to raze the building and blacktop the lot for parking. But luckily Patricia Fitzmaurice, who was already an ardent preservationist, happened by on her bicycle one fall day and learned the plans. She saw the historic exterior, and even more surprising, the incredible array of period tools



BILL MAHONEY

June 1, 1907: The Wood Bros. Piano Movers' Express wagon is in line on Lowell Street in Arlington Heights waiting to take part in the Centennial Parade, probably the biggest parade in the history of the town. "It looks like an upright piano is on the back with a derrick on the hitch", wrote Leonard Collins in *The Advocate* in 1971. "The driver is a gentleman known as Joe Forest. His partner is Mr. Wood, the owner of the business."



The Zion Evangelical German Lutheran Church in Boston's South End, as it looks today. This Greek Revival brick building opened its doors on Christmas Day, 1847. Jacob Schwamb was a co-founder of the church. It is on Shawmut Avenue at Waltham Street and predates the graceful row houses of the era of the residential squares. The building was a Syrian restaurant when the area had a middle-eastern population, but has been used only for storage since at least the 1970s. Notice the church-like double entrance and the long windows, now partially boarded up.

and machines within. With the help of a small group of concerned Arlingtonians, she started the process that would result in the creation of a working museum, the Old Schwamb Mill, now in operation for thirty-five years.

Theodore Schwamb died in 1909. The piano-case business began to lag with the increasing interest in recordings, and especially with the advent of the radio in the early 1920s. Peter Schwamb retired in favor of Philip Eberhardt in 1924 and died unexpectedly in 1928 in the midst of his family at his house at 33 Academy Street. When Philip Eberhardt sold the business to the Nickerson family in 1931, the company name of Theodore Schwamb was retained. A decision was made to switch products to high-end architectural woodworking. This was a felicitous decision, given the extensive interior areas available and the skills, particularly of Italian workers, in the area. During the next forty-plus years, the Theodore Schwamb Co. became known nationwide for large projects of interior wood paneling and woodcarving.

Their work included elaborate projects for Yale University in New Haven; for the Tryon Palace at New Bern, North Carolina; for the original John Hancock Building in Boston and at the Harvey Firestone Library at Princeton, N.J.

The firm of Cascieri di Biccari (the late Archangelo Cascieri, Dean of the Boston Architectural Center and Adio di Biccari, Arlington sculptor) opened a studio at Theodore

Schwamb. Over four decades, this firm produced a wealth of carving and sculpture, including the exquisite Cascieri carvings for Marsh Chapel at Boston University; and the di Biccari sculpture ensemble opposite West Street on the Boston Common. One photo, taken in Arlington at the Schwamb Studio in the 1950s, shows a giant sculpture of St. Clement. The ponderous saint lies prone on a truck, having made it through of the wide doors of the Schwamb's most attractive structure, a small, classic brick building with brick detail, a building still extant today at 1167 behind the old homestead. After arriving safely at his Brighton destination, St. Clement was hoisted to very top of the facade of St. John Seminary.

The fact that such buildings still exist is to the credit of the Mirak family, a long-time Arlington family whose firm has specialized since 1936 in dealerships and service of cars and trucks.

Recently, the firm developed a residential complex in Arlington Center called "The Legacy." Robert Mirak recently commented that "when my father, John Mirak, purchased the property in the 1970s, some of his colleagues suggested tearing down the buildings to make way for another dealership or a major shopping center. My father decided to keep the buildings and used the property to store excess auto inventory. In addition, he liked the looks of the buildings and especially the handsome red brick and the colonial windows. From that time to the present, my father and in succession, the family has upgraded the buildings. Inside,

over the decades, we have upgraded floors and brickwork. Specifically, the original wood flooring, which was blackened by use, was cleaned, sanded and urethaned to a handsome finish. Also, a number of walls were sandblasted to remove the paint on the brick; the results were sparkling."

At this Theodore Schwamb complex, it is gratifying to see how many small businesses have found a home: the Image Inn has run a photographic studio there since 1982, specializing in the rare skills and patience required by traditional techniques; the architectural firm of Rovinelli is upstairs at 1167; and there are many individual artists in residence at the large complex at 1165.

The Charles Schwamb Mill at 17 Mill Lane did not grow as large as the Theodore Schwamb Company, and it was never as visible, either. But however much the market fluctuated, Charles Schwamb and his descendants never gave up making fine oval frames. Amidst the final commercial years of competition from inferior wood and plastics, the Mill continued this work, as it does today, thanks to the late Patricia Fitzmaurice and her supporters. In the end, the Old Schwamb Mill can lay claim to having endured, both as living history and as a working Mill. All three brothers, Theodore and Charles and Jacob, could be proud that their generation of immigrants achieved so much that is still treasured in Arlington today.

By Grace Dingee, Mill Historian

even though they were threatened at times in the years when school divestment was the fashion, the premise being that the school-age population would continue to decline. In 1899 also, Peter Schwamb, a long-time member of the Arlington Water Commission, was, in the words of William Cutter, “instrumental in having the town admitted into the Metropolitan water system.” He remained active at Theodore Schwamb Company and joined in its incorporation as Treasurer in 1897.

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But if he had to choose sawdust, rather than music, nevertheless, he remained a dutiful son and partner in the firm. He was the only son available at that time. When his only brother, Herbert Page, reached maturity 11 years later, he chose to go west to Denver. Within these limitations, Carl and his parents seemed to understand one another. He served as alternate organist, not only at the First Baptist Church where the family worshipped, but at various churches in the Heights and in Lexington. He was pianist for many years for the Sunday school of the First Baptist; and he designed music curriculum for the Arlington schools. Carl William died at the relatively early age, of 57 in 1912; yet for many decades thereafter a harpsichord stood on the third floor of the Mill as a reminder. In gratitude for Carl



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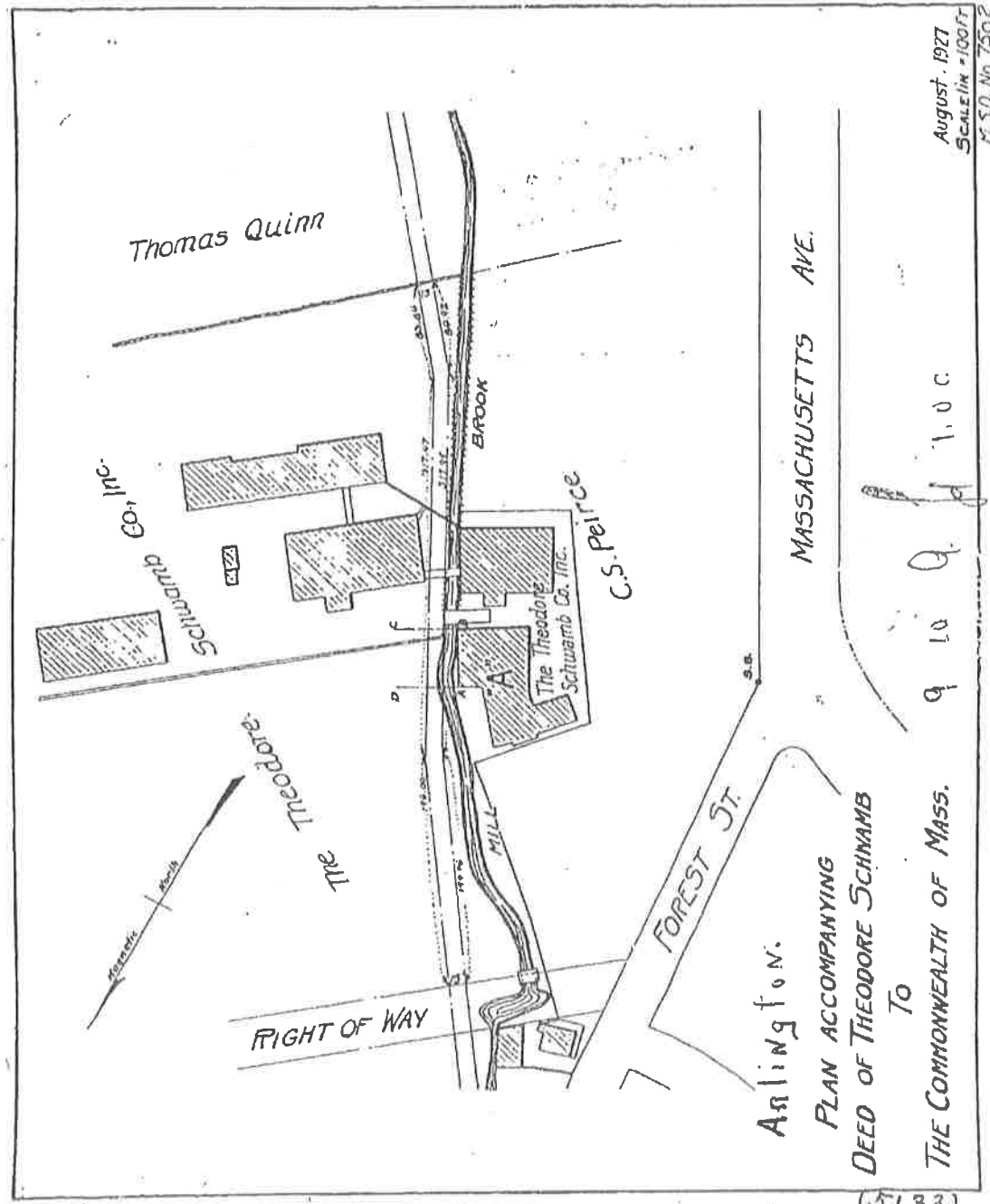
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5133/75



August, 1927
SCALE IN = 100 FT.
M.S.D. No. 7502

9 10 Q. 1.0 C.

(5133)

September 9, 2020

Arlington Conservation Commission
730 Massachusetts Ave.
Arlington, MA 02476

Re: Photos of Mapped Stream Locations
Supplement to Request for Determination of Applicability
1165-1167 Mass Ave. & 0 Ryder Street - Arlington, MA

1. Introduction

Goddard Consulting, LLC (Goddard), is pleased to submit photographs documenting the absence of streams or freshwater wetlands upgradient of the drainage ditch known as "Ryder Brook." This information is being submitted on behalf of "1165R Mass Ave MA Property LLC." This information is being submitted upon request of the Commission based on comments during the public hearing for an RDA on September 3, 2020. This document provides additional information from the original document titled "Drainage Ditch Analysis," dated August 10, 2020.

2. Methods

The USGS StreamStats website shows two streams coalescing south of Edmund Road and then connecting to Mill Brook in the vicinity of the subject property (Figure 1).

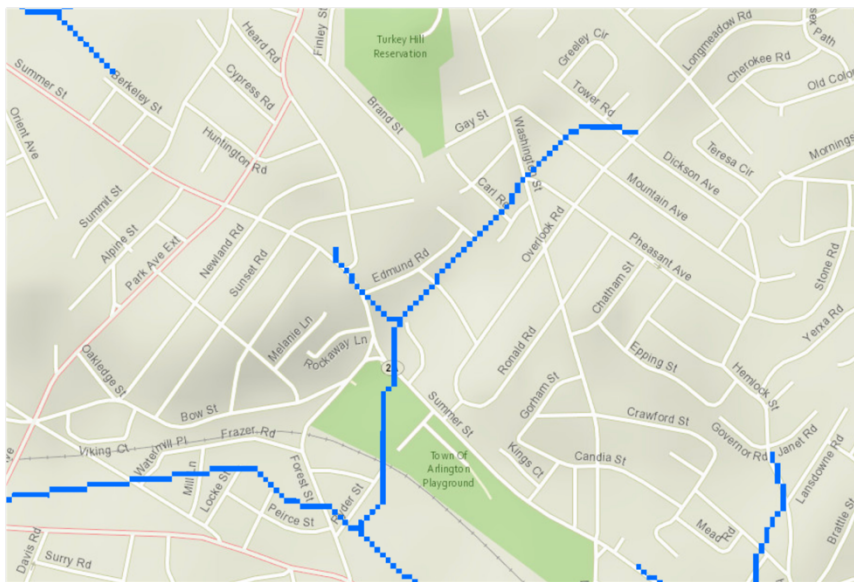


Figure 1 - StreamStats map view of streams flowing into Mill Brook.

On September 9, 2020 I walked on all publicly accessible routes in the vicinity of where the StreamStats map shows these streams to be located. Figure 2 shows the location of the walked route and numbered photograph locations. A GPS was used to track the route.



Figure 2 - Map showing the route walked for inspecting areas for presence of wetlands or streams.

3. Photos Showing No Stream or Wetlands at Numbered Locations



Photo 1



Photo 2



Photo 3



Photo 4



Photo 5



Photo 6



Photo 7



Photo 8



Photo 9



Photo 10



Photo 11



Photo 12



Photo 13

If there are any questions concerning this submission, please do not hesitate to contact me.

Sincerely,

Goddard Consulting, LLC

by 

Dan Wells, M.S.
Senior Wildlife Biologist & Wetland Scientist

Patricia Barron Worden, Ph.D.

Testimony for Conservation Commission Re:
Request for Determination of Applicability:
1165R Massachusetts Avenue

(Please include this material in formal testimony regarding the 1165R Massachusetts Avenue 40B Project)

To Chairperson Chapnick and Members of the Commission,

As you are, no doubt aware, it has been noted in the recent study of the Mill Brook Corridor that it is “of vital importance for environmental, economic, recreational, flood control, and transportation issues for Arlington’s Mill Brook corridor which stretches from the reservoir to the Mystic Lakes. Arlington Master Plan, was adopted in 2015 with numerous recommendations for future action, including a renewed look at the Mill Brook Corridor and all past studies.”

The report cited seven categories of issues which should be addressed to maximize the rehabilitation of the Brook and its economic potential for Arlington these are: “environment/ecosystem management, flood control, recreation, economic development, transportation, historical context, and place-making. Many of these actions require substantial collaboration with private property owners and/or multiple Town departments, and therefore cannot be completed on a set timeline.”

The importance of the Conservation Commission to proper stabilization, rehabilitation, and protection of Mill Brook and appropriate commercial development is of vital importance.

Accordingly it is of great concern that an attempted end run around Arlington zoning and proper land/wetland protection planning of this major Industrially zoned land area at 1165R Massachusetts Avenue is being attempted to achieve dense residential 40B development.

I hope the Commission can reach conclusions which will bar this 40B project. Certainly the semantics and considerations involved in the narrow parameters of the Request for Determination of Applicability at 1165R Massachusetts Avenue are challenging. But regarding the Ryder Brook situation it seems inappropriate to make any determination regarding M.G.L. c. 131, sec. 40 during a very dry summer.

Also great caution should be taken regarding the 40B project proponent’s attempted use of self-serving arguments concerning the matter of 104 Stony Brook, LLC, 2018 WL 6040701 (2018). Any case involving sparsely-populated Weston (one of the wealthiest towns on a per capita basis in Massachusetts) is totally irrelevant to a dense, middle class community like Arlington.

I should point out that your decision could be precedent-setting regarding developer/landowner/residential real estate speculation in this most important Mill Brook region.

Patricia Barron Worden, Ph.D.

Former member and Chair Arlington Housing Authority

Former Charter member, Human Rights Commission

Town Meeting member, pct 8

Member, Housing Plan Implementation Committee

Don't Pollute the Mill Brook with 40Bs

To the Editor,

Arlington's crown jewel is an unappreciated diamond in the rough. It has survived for eons and served many needs despite abuse. It is the Mill Brook (MB):

<https://www.youtube.com/watch?feature=youtu.be&v=MM834ZozpQM>

In Arlington for centuries MB has brought prosperity to Arlington. In 1985 Arlington's 350th Anniversary Committee presented a celebratory play about its industry. Its swift running water powered mills to process, produce and manufacture products used domestically or shipped all over the world. Today most of the mills are gone. MB's holding ponds are now school playing fields, gyms etc. Only the Old Schwamb Mill and the Theodore Schwamb Mill remain. But the MB Corridor still offers plenty of opportunity for economic development.

<HTTPS://WWW.ARLINGTONMA.GOV/HOME/SHOWDOCUMENT?ID=46513>

<HTTPS://WWW.ARLINGTONMA.GOV/HOME/SHOWDOCUMENT?ID=31058>

Opportunity for small life sciences spin-offs, technology entrepreneurs, service businesses etc. capitalizing on the boom of commerce/software development/biotechnology in all surrounding communities is being lost for Arlington and MB corridor. That is because Town Manager and his appointed ARB and Planning Department favor almost exclusively dense residential development. Far from soliciting new commerce they are even exacerbating demolition of existing businesses and restaurants to allow more residential density with its wealth transfer to developers/real-estate-industry/architects as encouraged by MAPC of which the Manager is Vice Chair. This is horrendous - Arlington being second most dense Massachusetts town. Schools are overcrowded, residential taxes are increasing. See warning of inadequate commercial tax revenue at Town Meeting:

https://youtu.be/MhdU_VDMaCQ?t=8689

With commerce now unsolicited and discouraged, jobs and internships, long a boon to residents, are gone. Even high school students could get jobs – e.g. at MB's former Brigham's ice cream manufacturing facility or as assistants in one of the Corridor's small artisan businesses.

From Massachusetts Avenue at Mirak auto dealership in Mill Brook Corridor one can view Theodore Schwamb Milll on one of the largest Industrially zoned lots on MB. Arlington's late John Mirak's dealership succeeded well at this site. Winchester Mirak heirs hoard land and now plan to use it as a cash cow by doing an end run around Industrial zoning to erect a six storey apartment building. They are doing this (realizing Manager's desire for residential density) by trying to force 40B development for residences in our Industrially zoned land which our Town Meeting-enacted zoning bylaws do not allow. Arlington cannot afford to lose Industrial land.

Select Board, ZBA, and Conservation Commission should strongly oppose this 40B project.

Patricia Worden

KRATTENMAKER O'CONNOR & INGBER P.C.

ATTORNEYS AT LAW

ONE MCKINLEY SQUARE
BOSTON, MASSACHUSETTS 02109
TELEPHONE (617) 523-1010
FAX (617) 523-1009

September 24, 2020

CHARLES G. KRATTENMAKER, JR.
MARY WINSTANLEY O'CONNOR
KENNETH INGBER

OF COUNSEL: RAYMOND SAYEG

VIA EMAIL

Susan Chapnick, Chairperson
Conservation Commission for the
Town of Arlington
730 Massachusetts Avenue
Arlington, MA 02476

Re: Request for Determination of Applicability – 1165R Massachusetts Avenue,
Arlington, MA

Dear Chairperson Chapnick:

Further to the discussion at the September 17, 2020 hearing on the request of 1165R Mass Ave MA Property LLC (hereinafter referred to as the "Petitioner"), on the application for a request for determination of applicability that the area shown as an existing drainage ditch, known locally as "Ryder Brook", does not meet the definition of a "stream" as set out in 310 CMR 10.04 and is thus not a jurisdictional resource area, I provide below what I respectfully suggest is the controlling facts and law that support such a determination.

- ***Facts which substantiate the conclusion that Ryder Brook, so-called, is not a "stream" as defined in 310 CMR 10.04 and, therefore, is not a jurisdictional resource area.***

Dan Wells, a senior wildlife biologist and wetland scientist at Goddard Consulting, LLC, Northborough, Massachusetts, has provided the Commission with substantial narrative and photograph evidence in his submissions of August 10 and September 9, 2020, respectively, that clearly support the conclusion that Ryder Brook is not a stream as defined in the above-referenced CMR.

The facts on which he bases his professional opinion and conclusion include:

1. The 1943 USGS map, which is Figure 2 to his submission of August 10, 2020, shows the stream flowing from Turkey Hill to Mill Brook but no longer depicts a wetland at the source of the stream. The 1946 USGS map (Figure 3) shows a complete disappearance of the former source of the stream system from Turkey Hill.
2. The 1956 USGS map, which is Figure 4 in his submission of August 10, 2020, shows the entire Turkey Hill area had been converted to residential housing.

KRATTENMAKER O'CONNOR & INGBER P.C.

Susan Chapnick, Chairperson
September 24, 2020
Page 2

3. The 2018 USGS map (Figure 5) shows no wetlands or stream leading down Turkey Hill towards Mill Brook. This is the current condition, which is the condition relevant for purposes of the RDA as noted by the court in the Matter of Martha Jean Eakin case referred to hereinbelow.
 4. Mr. Wells walked the area from the top of Turkey Hill to the culvert discharge just below the Minuteman Bikeway on two separate occasions, August 10 and September 9, 2020, and found no wetlands upgradient of the onsite drainage ditch or streams.
 5. Charles Tirone, vice chairperson of the Commission, requested at the September 3, 2020 hearing that the hearing be continued to enable him to conduct his own inspection of the area. During the September 17, 2020 hearing, he stated Ryder Brook is not a stream.
 6. Catherine Garnett, an associate commissioner, reported at the September 17, 2020 hearing that she lives in the vicinity and that she has observed no stream or wetlands.
 7. There is no freshwater wetlands upgradient of the discharge point from under the Minuteman Bikeway. The source of the water flowing through the ditch (when it was or is flowing) is entirely from catch basins.
 8. Based upon the definition in 310 CMR 10.04, the fact that any water from the Ryder Brook may discharge into a river or brook is not dispositive since “. . . a body of water which does not flow throughout the year (i.e., which is intermittent) is a stream except for that portion upgradient of all bogs, swamps, wet meadows and marshes.” (emphasis supplied).
- ***Law that supports a determination by the Commission that Ryder Brook does not meet the definition of a “stream” as set out in 310 CMR 10.04 and is, therefore, not a jurisdictional resource area.***

The administrative determination in the Matter of Martha Jean Eakin, Massachusetts DEP Reporter, Docket No. 2002-013, 10 DEPR 93 (2003) and 12 DEPR 36 (2005), copies of which are attached, are most instructive as to the applicable law.

In the Matter of Martha Jean Eakin case, several abutters to McLean Hospital of Belmont, Massachusetts challenged a determination of applicability made by the Belmont Conservation Commission and the Department of Environmental Protection that Junction Brook, a brook located on the McLean Hospital property, was neither a river nor an intermittent stream

KRATTENMAKER O'CONNOR & INGBER P.C.

Susan Chapnick, Chairperson
September 24, 2020
Page 3

because: (a) its flow ceased at its lower end; and (b) it is upstream of all bogs, swamps, wet meadows and marshes.

The Belmont Conservation Commission found that Junction Brook was "intermittent" based on: (a) the small size of its watershed; (b) observations that the stream occasionally ceased to flow at the Pleasant Street section of the stream; and (c) a lack of evidence that the stream is perennial. The Commission also found that there was no bordering vegetated wetlands adjacent to the brook and the source of the stream water flow was not bogs, swamps, wet meadows or marshes protected under the Wetlands Protection Act. Because Junction Brook is upstream of all bogs, swamps, wet meadows and marshes, the Commission concluded that Junction Brook is not a stream as defined in 310 CRM 10.04 as a matter of law. DEP concluded the same.

Indeed, these are nearly precisely the facts in this request for RDA. Here, based upon: (a) the small size of the watershed (it does not even appear on the USGS maps after 1903); (b) the unrebutted observations that the brook occasionally ceased to flow; (c) the lack of evidence that the stream is perennial; and (d) the fact that there are no bordering vegetation wetlands present and that the banks are bordered by greater than 90% upland plant species with upland soils (see Photo 1 to August 10, 2020 submission), the Commission must apply the law, conclude that Ryder Brook is an "intermittent" stream and grant the requested RDA.¹

As a matter of law, if a stream is shown as perennial on the current USGS map, it is presumed to be perennial. 310 CMR 10.58(2)(a)1. If it is shown as intermittent or not shown at all on the USGS map, the Commission must accept the information as prima facie evidence that it is intermittent.

It is for the issuing authority, here, the Commission, or others, to present evidence that the stream is not as it appears on the USGS map. 310 CMR 10.58(2)(a)1.a.i and 1.a.ii; See In re Matter of Martha Jean Eakin, 10 DEPR 93 (2003). In order to reject the Petitioner's request for the RDA requested, the Commission must have evidence that contradicts the information provided by the Petitioner. The Commission may not refuse to issue the determination requested because it is "unpersuaded" or "unconvinced" that Ryder Brook is not a stream unless it can rely on evidence contradicting the evidence proffered by the Petitioner.

Further, a stream must, by definition, flow out of, through, or into a wetlands resource area. 310 CMR 10.04; See Matter of Martha Jean Eakin, 10 DEPR 93 (2003). Accordingly, in the alternative, even if Ryder Brook flows throughout the year, which it does not, it cannot be a stream because it does not flow out of a presently existing bordered vegetated wetland or through

¹ The Arlington Conservation Commission's definition of "Stream" excludes the phrase in the definition contained in 310 CMR 10.04, specifically the phrase "except for that portion upgradient of all bogs, swamps, wet meadows and marshes". The Petitioner notes that the Petitioner's RDA is as to whether the stream is not a jurisdictional resource area under the Massachusetts Wetlands Protection Act.

KRATTENMAKER O'CONNOR & INGBER P.C.

Susan Chapnick, Chairperson
September 24, 2020
Page 4

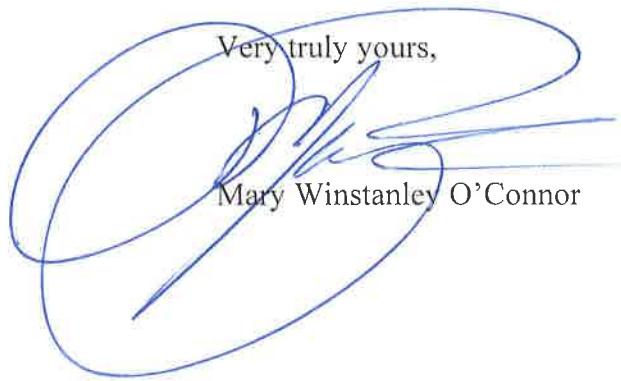
one. Therefore, under the stream definition set out in 310 CMR 10.04, the portion of Ryder Brook contained on the Petitioner's property is not a stream and contains no wetland resource areas.

Though one of the earlier USGS maps show that at the time period that the wetland and the spring in their original condition may have provided enough water to Ryder Brook to convince the map maker that the brook was perennial, that is not dispositive today. "[I]t is the current condition, in which the spring and the wetland no longer exist, that controls this case." See In the Matter of Martha Jean Eakin, 12 DEPR 36 (2005).

The un rebutted evidence presented by the Petitioner is that: (a) Ryder Brook has been observed to flow intermittently; and (b) Ryder Brook does not flow out of or through a bog, swamp, wet meadow or marsh. Accordingly, as a matter of fact and law the Commission must issue the RDA requested by the Petitioner.

On behalf of the petitioner, I thank the Commission for its diligence, expertise and time.

Very truly yours,



Mary Winstanley O'Connor

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See Matter of Martha Jean Eakin cases – copies enclosed



View Decision Archive

Publication Massachusetts DEP Reporter (1994-present)

Name:

Decision MARTHA JEAN EAKIN

Name:

Case 10 DEPR 93 (2003)

Citation:

Decision

Detail:

In the Matter of MARTHA JEAN EAKIN

Docket No. 2002-013

Determination of Applicability

Landowner: McLean Hospital Corporation, Inc.

Property: 115 Mill Street

Belmont

May 2, 2003

James P. Rooney, Administrative Law Judge

PARTIAL SUMMARY DECISION

Introduction

Petitioners challenge a superseding determination of applicability in which the Department found that a brook on the McLean Hospital property in Belmont is not a river because it flows intermittently and is not an intermittent stream because it is upstream of all bogs, swamps, wet meadows, and marshes. McLean has moved for a summary decision that the brook is intermittent based on observations that its flow ceased at its lower end. Petitioners oppose the motion, arguing that the brook should be considered perennial because its flow is reduced by groundwater infiltrating into the hospital's sewer system. They also ask for discovery to prove this theory.

I grant partial summary decision and deny the discovery requested. I conclude that the Wetlands Protection Regulations do not allow consideration of the impact of infiltration on stream flow and consequently find that the lower portion of the brook is intermittent based on the uncontroverted observations that flow occasionally ceases. However, because the upper portion of the brook has not been observed to run dry and because the Wetlands Protection Regulations allow different determinations to be made for different segments of a stream, a genuine and material issue of fact remains as to whether the upper portion of the brook is perennial. I therefore establish a schedule to hear that issue.

Background

McLean Hospital is a mental health hospital that has been located at 115 Mill Street in Belmont since the end of the nineteenth century. The 20 or more buildings that make up the hospital are built on a multi-acre wooded hill. Sewer and storm drains, some from the 1890s, lie under the buildings and parking lots that make up the hospital.

Junction Brook originates under a parking lot of one of the hospital buildings known as Higginson House. It flows east out of a pipe under the main hospital road (called appropriately enough Main Road), then steeply downhill, dropping 110 feet in elevation over the course of an 800 foot run. It enters a culvert under Pleasant Street, which is a boundary of the hospital property, and thereafter enters Wellington Brook, a perennial stream.¹ A long-existing hospital sewer line runs parallel to the stream.

Junction Brook is a first-order stream, meaning it has no tributaries. It is fed by groundwater from a six-acre watershed, some of which includes wetlands altered long ago, and flows in its upper reaches through a deep, ir channel. It is shallower and less confined in its lower reaches. The water in Junction Brook infiltrates through th...

stream bed, resulting in diminished stream flow as the brook flows downslope. Junction Brook is not shown on the latest map of the area published by the U.S. Geologic Survey.

In 1997, McLean Hospital asked the Belmont Conservation Commission to determine that Junction Brook is intermittent. The Commission did so, based on evidence that the brook did not flow during July 1997 at its Pleasant Street end. That determination was valid for three years and expired in 2000. See 310 CMR 10.05(3)(b)1.

In March, 2001, Martha Eakin, a Belmont resident who owns land abutting McLean, sought a determination that the brook is perennial. The Commission concluded again that the stream is intermittent based on the small size of its watershed, observations by McLean employees that the stream occasionally ceased to flow at Pleasant Street, and a lack of evidence that the stream is perennial. The Commission found no bordering vegetated wetlands adjacent to the brook. It concluded that the "groundwater regime in the altered wetlands continues to drive the aquifer flow," which is the source of the stream's water, but that these altered wetlands were not bogs, swamps, wet meadows or marshes protected under the Wetlands Protection Act, M.G.L. c. 131, §40. Because Junction Brook is upstream of all bogs, swamps, wet meadows, and marshes, the Commission concluded that it is not a stream as defined in the Regulations at 310 CMR 10.04.

Eakin and 19 other Belmont residents asked the Department to supersede the Commission's determination and find that the stream is perennial. The Department, too, determined that the brook is intermittent, and therefore was not a river, based upon its small watershed and the reported observations of no flow. It acknowledged that wetland filling by the hospital might have interfered with stream flow to an extent, but concluded that alterations before 1973, when the Wetlands Protection Act became effective, were irrelevant to the stream's status under the Rivers Protection Act, which itself became effective in 1996. It considered Eakin's claim that groundwater is infiltrating into the hospital sewer system and was being diverted from the stream, but decided that such interception, if any, did not affect stream flow and was not the type of water withdrawal that must be considered when evaluating whether a stream is perennial. See 310 CMR 10.58(2)(a)1.c.2 The Department determined, as had the Commission, that Junction Brook is not stream subject to regulation because its source is not a wetland and it does flow through a wetland.

Eakin and Joan Wissmann, another abutter, appealed, as did a ten residents group made up of Eakin and other Belmont residents, and the Belmont Citizens Forum, which later withdrew. Administrative Law Judge Mark Silverstein held a prehearing conference and established as issues to be adjudicated whether Junction Brook is intermittent or perennial and whether there are any bordering vegetated wetlands associated with it. In a later conference call, petitioners' counsel informed me that petitioners were no longer pursuing a bordering vegetated wetland claim.

In order to find evidence to support their theory that groundwater is infiltrating into the sewer system, petitioners, with the hospital's cooperation, had a "dye test" performed on a section of the sewer to determine if it was connected to the storm drain system of the facility. In the dye test petitioners performed, colored dye was introduced into existing flows at the upper ends of both the sanitary sewers and the stormwater mains. The color of the water at the lower end of the systems was then observed to confirm flow pathways and determine whether there were any cross-connections between the two systems. The dye test failed to show any such connection.

The hospital declined to allow petitioners to conduct a "smoke test" on the sewer system. In the proposed smoke test, white smoke would be introduced into three manholes at the hospital and then a blower would be placed over the manholes for three minutes to disperse the smoke into the system and thereby identify indirect piping connections, pipe defects, or seepage through the soil seams. Petitioners allege this will provide additional information about stormwater and groundwater entry into the sewers. McLean fears that smoke could enter the hospital and disturb the patients. Petitioners moved to compel McLean to allow a smoke test.

At the same time, the hospital moved for summary decision on the intermittent/perennial stream issue, arguing that the stream is intermittent because it occasionally ceases to flow and that petitioners' infiltration theory is irrelevant to this ultimate determination. The Department supports the hospital's motion.

The affidavits submitted by the parties, including supplemental affidavits reflecting the results of the discovery obtained by petitioners, report observations that the stream has on occasion ceased to flow at its Pleasant Street base but not at its outlet pipe source at the top of the hill. I asked the parties to brief the impact of these observations on the determination of stream status. Specifically, I directed them to address whether the Regulations require that all portions of the brook upstream of the point where it becomes intermittent should be considered intermittent or whether different portions of the stream could be separately characterized. Petitioners responded that different portions of the stream can be characterized separately, while McLean and the Department maintain, for different reasons, that this stream should be treated as uniformly intermittent. The parties stipulated that:

The stream has been observed dry for a distance of 200 feet above (north of) the Pleasant Street headwall. ... There are no recorded observations of the stream being dry between Main Road and the point that is approximately 200 feet north or above Pleasant Street.

Discussion

I. Regulatory Framework

If Junction Brook flows perennially, then it is a river for purposes of the Rivers Protection Act with a protected riverfront area on both of its sides.³ A "river" is a "natural flowing body of water that empties to any ocean, lake, or other river and which flows throughout the year." M.G.L. c. 131, § 40, ¶ 14. The Wetlands Protection Regulations repeat this entire definition verbatim and go on to state that "[p]erennial streams are rivers; intermittent streams are not rivers." 310 CMR 10.58(2)(a)1.

If Junction Brook is entirely intermittent, it is not a river or a stream. The Wetlands Protection Regulations define "stream" as:

a body of running water, including brooks and creeks, which moves in a definite channel in the ground due to a hydraulic gradient, and which flows within, into or out of an Area Subject to Protection Under M.G.L. c. 131, § 40 [the Wetlands Protection Act]. ... Such a body of running water which does not flow throughout the year (i.e., which is intermittent) is a stream except for that portion upgradient of all bogs, swamps, wet meadows and marshes.

310 CMR 10.04. Bordering vegetated wetlands include bogs, swamps, wet meadows, and marshes. 310 CMR 10.55(2) (a). There is no longer any argument by petitioners that Junction Brook flows out of or through a bordering vegetated wetland. Junction Brook is therefore upgradient of all bogs, swamps, wet meadows and marshes. Hence, if it is intermittent, it is not a stream for purposes of the Wetlands Protection Regulations.

The Wetlands Protection Regulations set forth the method for determining whether a stream is perennial or intermittent.⁴ If a stream is shown as perennial on the current United States Geologic Survey map, it is presumed to be perennial. 310 CMR 10.58(2)(a)1.a. If it is shown as intermittent or not shown at all on the U.S.G.S. map, it is considered, at least initially, as intermittent. The issuing authority, or any person, may present evidence that the stream is not as it appears on the U.S.G.S. map. 310 CMR 10.58(2)(a)1.a.i and 1.a.ii. The Regulations list the types of evidence that may be useful in determining whether a stream is intermittent or perennial, such as its stream order and the size of its watershed. They also allow reliance on any other relevant evidence. 310 CMR 10.58(2)(a)1.a.i and 1.a.ii.

A stream that ceases to flow during some portion of the year will ordinarily be treated as intermittent. But the Regulations take into account the possibility that a stream that is usually perennial may run dry. If a stream has dried up because of an "extended drought," it is still considered perennial. 310 CMR 10.58(2) (a)1.c. Furthermore, a stream that is "perennial under natural conditions but affected by drawdown from withdrawals of water supply wells or direct withdrawals shall be considered perennial." 310 CMR 10.58(2)(a)1.c.

II. Summary Decision Ruling

The central argument McLean makes in its summary decision motion is that the Wetlands Protection Regulations do not allow consideration of the effect of groundwater infiltration on stream flow when deciding whether a stream is perennial or intermittent. If McLean is correct, petitioners' groundwater infiltration theory is irrelevant, and there would be no need for additional discovery to support it. For this reason, I consider the summary decision motion first.

A. Stream Flow Analysis Must be Complete

McLean argues that when examining whether Junction Brook is intermittent or perennial, the analysis should not even reach the question of the impact of infiltration on stream flow. In its view, the impact of drought, drawdown, water withdrawal — or, hypothetically, infiltration — on stream flow can be considered only when a stream, which in its "natural state" is perennial, has dried up. Junction Brook is not such a stream, McLean maintains, because it is a first-order stream with a small watershed that has been observed to be dry and that was determined previously to be intermittent.

I do not agree. The Regulations do not require that a separate determination be made that a stream in its natural state would be perennial before consideration is given to whether drought, drawdown, or water withdrawal are responsible for an observation that the stream has gone dry. Otherwise, a subsequent analysis of the impact of factors on the stream would be a foregone conclusion.

Rather, the Regulations allow an overall judgment to be made about whether a stream that has run dry is an intermittent or perennial stream. This is done by taking into account characteristics of the stream itself and its watershed that help predict whether flow is truly perennial and the presence or absence of three particular external impacts on the stream's watershed (extended drought, well water withdrawal, or direct withdrawal).

Thus, observations of no flow in a stream whose status is to be determined do not end the analysis. The effect of extended drought, well water withdrawals, or direct withdrawals, if any, on stream flow must be taken into account before the stream can be found to be intermittent or perennial.

B. Infiltration Need Not Be Considered

The question then is whether a complete analysis may take into account any evidence petitioner develops that groundwater is infiltrating into the hospital's sewer system and is thus being diverted from the stream. All parties agree that some groundwater that would have fed the stream is instead entering the sewer system. Indeed, the Department and McLean acknowledge that when McLean upgrades the sewer system, as it plans to do, infiltration will be reduced and water flow will likely increase in Junction Brook. They disagree about whether the present impact of infiltration on stream flow may be considered under the Regulations.

The Regulations list the types of evidence about the characteristics of the stream itself or its watershed that may be considered generally in determining whether a stream is intermittent or perennial. They mention specific types of such evidence, such as the size of the watershed and the nature of the stream channel, and also include a broadly phrased category of "other evidence." However, when the Regulations turn to the types of human and natural external influences that may cause an ordinarily perennial stream to run dry, they list only three things — "extended drought," "drawdown from withdrawals of water supply wells," or "direct withdrawals." They make no mention of any other potential natural or human influences on stream flow or on groundwater flow in the watershed that may be considered.

Because the Regulations allow consideration of only these three external factors that might cause streams to run dry, petitioners' theory that groundwater is infiltrating into the sewer system may be considered only if evidence supporting it would establish drought, drawdown from withdrawals of water supply wells, or direct withdrawal. As infiltration is not related to drought, only the other two factors need be examined.

The Department does not define drawdown from withdrawals of water supply wells or direct withdrawal in the Wetlands Protection Regulations. Drawdown is defined in Division of Environmental Management regulations governing the registration of well drillers. It is the "extent of lowering of the water surface in a well resulting from discharge of water in the well." 313 CMR 3.01(2). That is, when a well is pumping out water, it tends to lower (or draw down) the level of the groundwater being pumped. This definition reflects a common understanding of what "drawdown" means, which I apply in the absence of a definition in the Wetlands Protection Regulations. "Drawdown from withdrawals of water supply wells" refers, thus, to a drop in the groundwater level caused by pumping of private or public water supply wells.⁵ Petitioners do not allege that McLean or anyone else is drawing down water from Junction Brook by pumping water supply wells. Hence, this factor is irrelevant.

The only remaining external factor that may be considered is direct withdrawal. Withdrawal, too, is not defined in the Wetlands Protection Regulations. It is, however, defined in the Department's regulations establishing a statewide process for permitting water withdrawals under the Water Management Act, M.G.L. c. 21G. Under these regulations, a withdrawal is "the removal or taking of water for any purpose from a water source." 310 CMR 36.03. Applying this definition here, a direct withdrawal must refer to water withdrawn directly, rather than indirectly, from a water source. Water pumped from a pipe placed in Junction Brook would be a direct withdrawal from the brook. Petitioners do not allege this.

Infiltration is not defined in the Wetlands Protection Regulations either, but is defined in the Department's regulations governing financial assistance for water pollution control abatement projects as:

[w]ater other than wastewater that enters a sewer system ... from the ground through means which include, but are not limited to, defective pipes, pipe joints, connections, or manholes.

310 CMR 41.03. Stormwater "inflow"⁶ and groundwater "infiltration" into a sewer system increase the volume of water in the sewers. If the volume of water becomes too great, sewage may burst out of sewer pipes and pollute drinking water or it can overload the capacity of a sewage treatment plant and cause insufficiently treated water to be discharged to a receiving water. To prevent this, the Department requires that government bodies that qualify for financial assistance to construct a sewage treatment plant demonstrate that "each sewer system discharging in

proposed water pollution abatement project is not or will not be subject to excessive infiltration/inflow." 310 CMR 41.26(1).

Infiltration, so defined, is not a direct withdrawal of water. Infiltrated water comes from groundwater, which is potentially a water source, but it is not "withdrawn." Withdrawal involves a deliberate act, the "removal" or "taking" of water. See 310 CMR 36.03. Infiltration, on the other hand, involves simply "wastewater that enters a sewer system." 310 CMR 41.03 (emphasis added). Passive entry of groundwater into a sewer system is not the same as the deliberate removal of water from the ground.

Withdrawal is also for some "purpose." See 310 CMR 36.03. Infiltration of groundwater into the sewer system is not done purposefully. In fact, it is contrary to the purpose of the sewer system, hence the reference in the infiltration definition to the source of infiltration being "defective pipes, pipe joints, connections, or manholes," 310 CMR 41.03 (emphasis added), and the Department's requirements that infiltration be limited, 310 CMR 41.26(1).

Petitioners argue that the Department has now revised the Regulations to allow consideration of "other manmade flow reductions or diversions." See 310 CMR 10.58(2)(a)1.f (rev. December 20, 2002). Although the revised Regulations are literally inapplicable, petitioners maintain that they are simply a clarification of the Regulations applicable here and show that the Department always intended to allow broad consideration of external influences that may limit stream water flow.

I am not persuaded. As I noted, the Department chose to list in the Regulations promulgated in 1997 only three specific types of external factors that could be considered as potential influences on stream flow, and infiltration was not one of them. The applicable Regulations also do not include a broad category such as "other manmade flow reductions or diversions."

Whatever this phrase means in the current Regulations, I see no reason to believe that its present inclusion demonstrates that the Department always meant to allow consideration of groundwater infiltration into a sewer system. As the Department and McLean point out, it is difficult to determine whether infiltration causes Junction Brook (or any stream in an urbanized area) to dry up in the late summer. Sewer systems crisscross urbanized watersheds, such as those in Belmont, and do not respect watershed boundaries. Here, the sewer line that parallels Junction Brook contains sewage and infiltrated groundwater from the entire McLean facility, not just infiltration from the stream's small watershed. Even if some method could be devised to figure out how much groundwater from Junction Brook's watershed was entering the sewer system, that would not necessarily prove that the stream would flow throughout the year but for a correctable infiltration problem. All sewer systems suffer from some amount of infiltration; hence, 310 CMR 41.26(1) requires not that infiltration be eliminated, but that it not be "excessive." Given the immense practical difficulties of determining the impact of infiltration on stream flow, it is not surprising that the Department, which regulates infiltration, made no mention of it in the version of 310 CMR 10.58(2)(a)1.c it promulgated in 1997.

C. Discovery Ruling

Because infiltration is not a factor that may be considered when attempting to determine whether external forces are influencing stream flow, discovery concerning infiltration at the site is not likely to produce information relevant, under the Regulations, to the flow of Junction Brook. Accordingly, petitioners' motion seeking approval to conduct a "smoke test" of the sewer system is denied.

D. Upper and Lower Portions of Junction Brook

Additionally, because the effects of infiltration may not be considered, the observations that Junction Brook at its Pleasant Street end have gone dry cannot be discounted on the theory that infiltration was occurring. Junction Brook has been observed dry, and this lack of flow was not caused by extended drought, drawdown from withdrawals of water supply wells, or direct withdrawals. Therefore, at least the lower portion of Junction Brook flows intermittently.

1. Do the Regulations Allow Determinations for Different Stream Segments?

The Conservation Commission and the Department assumed that a finding that the lower portion of Junction Brook is intermittent meant that the entire brook is intermittent. Each determined that Junction Brook was intermittent for its entire length, although no evidence was presented to them that the upper portion of Junction Brook has ever been observed dry.

There is some regulatory basis in the Wetlands Protection Regulations for this conclusion. One of the characteristics of a river listed at 310 CMR 10.58(2)(a)1 is that it "empties into any ocean, lake, pond or other river." Intermittent streams are not listed, hence rivers cannot empty into intermittent streams. Consequently, if only this language

Regulations were considered, it might appear that if any portion of a stream were determined to be intermittent, the stream upstream of that point must be intermittent as well, even if it flows throughout the year.

There is other language in the Regulations that suggests that this is not a necessary result. Having reviewed this language and the parties' briefs, I conclude that the Regulations allow a portion of a stream that flows throughout the year to be treated as perennial, even if a downstream portion of the same stream is intermittent.

The Regulations provide that:

Rivers begin at the point an intermittent stream becomes perennial, or at a spring or pond which discharges through the year. ... Downstream of the point of perennial flow, a perennial stream normally remains a river except when interrupted by a lake or pond.

310 CMR 10.58(2)(a). If rivers "normally" remain perennial, then, by implication, rivers occasionally cease to be perennial. The reference to lakes and ponds covers situations in which rivers, by definition, cease, for when "rivers flow through lakes or ponds, the riverfront area stops at the inlet and begins at the outlet." 310 CMR 10.58(2)(a)1.e. Nothing in the language of 310 CMR 10.58(2)(a) suggests that this reference is meant to be an exclusive list of the situations in which rivers cease to be perennial. That would be contrary to other provisions in the Regulations, such as 310 CMR 10.58(2)(a)3, which treats riverfront area as ending when a river flows through a culvert more than 200 feet in length.

The Regulations also include a list of major rivers that are treated as rivers for their entire length. 310 CMR 10.58(2)(a)1.b. Absent this provision, it could be argued that some portion of any of these rivers is not perennial. By listing only some rivers as entirely perennial, the Department allows other rivers to be treated as perennial for a portion of their entire length, without reference to which portion.

Indeed, 310 CMR 10.58(2)(a)1.b is the only provision of the Regulations that decides the status of a river overall. In every other circumstance, the question of riverine status is determined piecemeal as it is raised in requests for wetlands permits or requests for determination concerning specific sites. As requests for action are limited to a particular site, the determinations made by issuing authorities are limited to those sites as well.

The Regulations should be read consistently with this approach. If a finding that a section of a particular stream is intermittent or perennial necessarily has consequences upstream or downstream, then the effect of that determination would not be limited to the site, even though the determination referenced the site alone. That would affect the interests of upstream or downstream owners, suggesting in turn that these owners are entitled to notice of any requests for a determination regarding a waterbody's rivers status, as well as an opportunity to be heard on this issue. If, on the other hand, the Regulations are read to allow for findings that a stream is perennial for certain stretches and intermittent for others, property owners along the stream would not necessarily be impacted. Moreover, the issuing authorities could focus exclusively on the nature of the stream at the site without having to consider whether some change in flow characteristics upstream or downstream has a bearing on the stream's status.

The Regulations can be so read because they allow for the possibility that a stream, once it becomes perennial, is not necessarily perennial for its entire length. The requirement that a river empty into an ocean, lake, pond or other river does not stand in the way. See 310 CMR 10.58(2)(a)1. The use of the word "empties" is a reference to the mouth of a river, for it is there that a river discharges or empties. The regulatory description of this riverine characteristic in fact parallels the dictionary definition of the mouth of a river, which is the "part of a river ... where its waters are discharged into some other body of water." The Random House Dictionary of the English Language 936 (1966). If for a perennial stream to be a river it must discharge into the Atlantic Ocean, a lake, a pond, or another river, that does not prevent it from having an intermittent section somewhere along its length.

2. Implication for Junction Brook Analysis

Having found that different segments of the same stream can be considered separately when determining whether they are intermittent or perennial, I next consider the implications for this case. The Department maintains that there should be none because the Regulations do not require that separate determinations be made for different sections of a stream this small and, in any event, the upper portion of Junction Brook, even if it flows throughout the year, is not a stream and therefore cannot be a river. A stream must, by definition, flow out of, through, or into a wetlands resource area. 310 CMR 10.04. The upper portion of Junction Brook does not flow out of a presently existing bordering vegetated wetland or through one. It flows into the intermittent lower portion of Junction Brook. That section of the brook is upgradient of all bogs, swamps, wet meadows and marshes. Therefore, under the stream definition furnished at 310 CMR 10.04, the lower portion of the brook is not a stream and contains no wetland

resource areas. Thus, the Department argues, the upper portion of the brook does not flow into a wetland resource and therefore is not a stream at all.

The question here is not whether Junction Brook is a stream, but whether it is a river. Focusing on whether it is a stream is not helpful because all rivers are also, by definition, streams. That is because all rivers flow through a resource area, namely their own riverfront areas.⁷

Thus, I focus solely on whether the upper portion of Junction Brook is a river. The Regulations broadly define river as "any natural flowing body of water" that "flows throughout the year." 310 CMR 10.58(2)(a)1. If Junction Brook flows throughout the year, as the affidavits submitted suggest, it meets part of the definition of a river. The only question is whether it empties into an "ocean, lake, pond, or other river." See 310 CMR 10.58(2)(a)1. I have already decided that this portion of the river definition refers to the terminus of the river, and thus a perennially flowing body of water that is upstream of an intermittent stream is a river so long as the body of water eventually terminates at the ocean, a lake, pond or another river. It should not matter whether the intermittent section of the body of water is within the Department's wetlands jurisdiction — so long as the intermittent section is simply an area where the river occasionally runs dry and not a discontinuity so complete that it cannot accurately be said that the perennial sections upstream and downstream of it are part of the same water body. Here, petitioner alleges that the upper portion of Junction Brook flows through the intermittent lower portion and then continues on after it crosses Pleasant Street as the perennial Wellington Brook. If that description is accurate, then the upper portion of Junction Brook may very well be a river.

But simply because the upper portion of Junction Brook could theoretically be a river does not necessarily mean that it is. The absence of a reported observation that the upper portion of Junction Brook has dried up is one factor to weigh in deciding whether it is perennial or intermittent, but it is not the only one. Furthermore, even if it is established that the brook's upper portion flows through the year and the lower portion flows intermittently, a question remains as to the location of the boundary between the perennial and intermittent portions of the stream. Evidence must be submitted to show whether a boundary between the two sections of the brook can be established, and if so where the boundary is.

These issues are well beyond the scope of any matters raised in the summary decision motion, and hence cannot be resolved in this decision. Accordingly, I decide only that the lower portion of Junction Brook is intermittent.

Conclusion

I find that the lower portion of Junction Brook is intermittent and grant McLean Hospital partial summary decision on that issue. Petitioners' request to compel a smoke test of the McLean sewer system is denied because the facts they seek to prove through this discovery are irrelevant to the brook's riverine status. Attached to this decision is a schedule for determining whether the upper portion of Junction Brook is perennial, and if so, what the boundary is between the perennial and intermittent sections of the stream.

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1. The record is unclear as to whether Junction Brook is a tributary of Wellington Brook or is just a differently named part of it.
2. 310 CMR 10.58(2)(a)1.c provides that a stream that is "perennial under natural conditions but affected by drawdown from withdrawals of water supply wells or direct withdrawals shall be considered perennial."
3. In 1996, the Rivers Protection Act amended the Wetlands Protection Act, M.G.L. c. 131, § 40 and set forth requirements for work that is proposed within 200 feet of the rivers of the Commonwealth.
4. The method described here is the one set forth in the Regulations effective October 7, 1997. The Department substantially revised the method for evaluating whether a stream is intermittent or perennial in Regulations issued on December 20, 2002. The revised Regulations do not apply to a request for determination, such as this one, that was filed before December 20, 2002. See 310 CMR 10.10(11)(rev. December 20, 2002). I therefore refer throughout to the 1997 version of the Regulations, unless noted otherwise.
5. [See next page.]
5. The reference to "water supply wells" excludes wells used for other purposes, such as wells meant to dewater a site during construction. See 313 CMR 3.01(definition of well or waterwell).
6. Inflow is:

[w]ater other than wastewater that enters a sewer system (including sewer service connections) from sources which include, but are not limited to, roof leaders, cellar drains, yard drains, drains from springs and swampy areas, manhole covers, cross connections between storm sewers and sanitary sewers, catch basins, cooling towers, storm waters, surface runoff, street wash waters, or drainage.

310 CMR 41.03.

7. As noted previously, the Department has recognized that in some circumstances rivers do not have their origins in intermittent streams or resource areas. Thus, water flowing throughout the year from a spring, which is not a resource area, is a river, so long as its terminus is a lake, pond, another river, or the ocean. See 310 CMR 10.58(2)(a). Petitioners contend that one of the sources of Junction Brook is a spring that McLean altered.

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Name:

Decision MARTHA JEAN EAKIN

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Case 12 DEPR 36 (2005)

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Decision

Detail:

In the Matter of MARTHA JEAN EAKIN

Docket No. 2002-013

Determination of Applicability

Landowner: McLean Hospital Corporation, Inc.

Property: 115 Mill Street Belmont

April 12, 2005

James P. Rooney, Administrative Magistrate

RECOMMENDED FINAL DECISION

DETERMINATION OF APPLICABILITY - appeal from a superseding determination of applicability that found a stream to be intermittent and therefore not a river. After a hearing, the superseding determination is affirmed based on observations that the stream has run dry. See 310 CMR 10.58 (2).

Introduction

This wetlands appeal involves a dispute over whether 600 feet of a small stream on the grounds of McLean Hospital is perennial or intermittent, and thus whether it is a river subject to protection under the Rivers Protection Act. The case is decided under the approach the Department of Environmental Protection (DEP) promulgated in 1997 to resolve such questions.¹ After a hearing, I conclude that although the stream section runs perennially during some years, it is intermittent in others when there is no extended drought and therefore is not a perennial stream or a river. It is not an intermittent stream either, because it is upgradient of all bogs, swamps, wet meadows, and marshes. I therefore affirm DEP's superseding determination of applicability.

Background

Junction Brook, which is the subject of this determination, is located on the 238 acre campus of McLean Hospital, a mental health hospital in Belmont. The site is a large wooded hill with the hospital buildings spread out at the top. Maps dating from the late nineteenth century, when hospital construction began, show an unnamed stream in the present location of Junction Brook, flowing down a steep slope southward toward Pleasant Street. At the time, a three acre wetland existed on the hilltop immediately to the north of where Junction Brook began to flow down the hill. There was also an active spring just to the north of the wetland. To all appearances, these were the headwaters that fed the brook.

Since that time, this area has been drastically altered. The wetland and the spring are no more. The wetland was filled in the 1930s to create a tennis court, which was later replaced in the 1960s by a parking lot for one of the hospital buildings, Higginson House. The hospital used the spring as a water source for a time. In 1939, it started purchasing municipal water from Belmont. Although the record is not entirely clear, it may have continued to use the spring for awhile thereafter as a source of water for fire suppression, but that use ceased more than twenty years ago. Where the spring once was is now a well topped by a manhole. The water in this well no longer springs.

Today, Junction Brook begins on a hillside just below a hospital roadway known as Main Road. It is 800 feet long and descends 110 feet during its run. Water flowing in the brook comes from natural sources — storm water runoff and

groundwater — but it is not conveyed naturally to the brook. Rather, two storm drainage pipes protruding from the side of the hill provide the brook's water. The water first flows into a sizeable pool with rocks at its bottom. From there, the brook descends steeply through sharply cut banks until it reaches the bottom of the hill. There the brook flattens out and its banks become less defined. During the course of its descent, flow in the brook decreases. One reason for this is that the stream is a "losing stream." During its run the streambed is above groundwater level; water flows through the streambed into the groundwater rather than vice versa. Finally, the brook enters a culvert under Pleasant Street. The culverted stream flows in a generally easterly direction until it eventually joins Wellington Brook, a perennial stream.

Interest in Junction Brook has increased since McLean announced plans to redevelop portions of the site, including, according to petitioner Suzanne Bass, the construction of a senior living center near the top of Junction Brook. Both McLean and petitioners requested, as the Wetlands Protection Regulations allow them to do, that the Belmont Conservation Commission (and then DEP) determine whether the stream is perennial or intermittent and, thus, the extent of jurisdiction to regulate work on the site under the Wetlands Protection Act, M.G. L. c. 131, § 40.

If a stream is perennial, it generally has a 200 foot wide riverfront area on either side of it; if it is intermittent, it has no such riverfront area. See 310 CMR 10.58(2)(a). The parties' many submissions imply that the presence of riverfront area adjacent to Junction Brook will have an impact on the proposed development. Because the plans for the senior center are not in the record, however, the nature of this impact is not certain.

McLean acted first. In 1997, it asked the Belmont Conservation Commission to determine that Junction Brook is intermittent. The Commission did so, based on evidence that the brook did not flow at the bottom of the hill in July 1997. The determination was valid for three years and expired in 2000. See 310 CMR 10.05(3)(b)1.

In March, 2001, Martha Eakin, a Belmont resident who owns land abutting McLean, sought a determination that the brook is perennial. The Commission once again concluded that the stream is intermittent. It found that the watershed of the brook is only six acres, far smaller than the three mile watershed the 1997 Regulations then provided was the likely minimum watershed of a perennial stream. It also found that this particular intermittent stream (or rather any wetland resource areas potentially associated with the stream, such as land under a water body and bank) was not protected under the Wetlands Protection Regulations. Under the Regulations, an intermittent stream is a stream "except for that portion upgradient of all bogs, swamps, wet meadows and marshes," all of which are types of bordering vegetated wetlands. 310 CMR 10.04. The Commission found no bordering vegetated wetlands adjacent to the brook. It noted that the "groundwater regime in the altered wetlands [the filled wetlands that are now a parking lot] continues to drive aquifer flow," meaning that groundwater is the source of the brook's water, but that the land under the parking lot is no longer a wetland protected under the Wetlands Protection Act, M.G.L. c. 131, § 40. Having concluded that Junction Brook is upstream of all wetlands, the Commission "reluctantly" found that Junction Brook contained no protected wetland resource areas.²

Eakin and 19 other Belmont residents asked DEP to supersede the Commission's determination and find that the brook is perennial. DEP, too, determined that the brook is intermittent, and therefore not a river, based on its small watershed and observations by McLean employees of no stream flow at the bottom of the hill. Eakin sought to counter these observations by claiming that groundwater is infiltrating into the hospital sewer system, particularly a sewer line that parallels the stream, and diverting water from the stream causing it to dry up at the bottom of the hill. DEP was not convinced such interception of groundwater affected streamflow and concluded that, in any event, this was not a factor to be considered when evaluating whether a stream is perennial. See 310 CMR 10.58(2)(a)1.c. Finally, DEP determined, as had the Commission, that Junction Brook is not a stream subject to regulation under the Wetlands Protection Act because its source is not a wetland and it does not flow through a wetland.

Eakin and Joan Wissmann, another abutter, appealed, as did a ten residents group made up of Eakin and other Belmont residents, and the Belmont Citizens Forum, which later withdrew. Administrative Law Judge (now Administrative Magistrate) Mark Silverstein held a prehearing conference and established as issues to be adjudicated whether Junction Brook is intermittent or perennial and whether there are any bordering vegetated wetlands associated with it. In a later conference call, petitioners' counsel informed me that petitioners were no longer pursuing a claim that the brook has bordering vegetated wetlands associated with it.

McLean moved for summary decision on the one remaining issue — whether Junction Brook is perennial. It argued that the undisputed facts show the brook to be intermittent. It relied on observations by its own witnesses and those made by several of petitioners' witnesses that streamflow ceases at times during the summer at the bottom of the hill. Petitioners opposed the motion, arguing that the brook should be considered perennial because its flow is reduced by groundwater infiltrating into the hospital's sewer system.

The Wetlands Protection Regulations acknowledge that human actions can cause what would otherwise be a perennial stream to cease flowing. They do not require, however, that issuing authorities sort out the impact of all human activities on a stream before determining whether it is perennial or intermittent. Rather, they provide that a stream that is "perennial under natural conditions but affected by drawdown from water supply wells or direct withdrawals shall be considered perennial." 310 CMR 10.58(2)(a)1.c. In ruling on the summary decision motion, I concluded that any passive infiltration of groundwater into McLean's sewer system was neither a drawdown of water by a water supply well nor the direct, active extraction of water from a water source. Therefore, the impact of the sewer system on Junction Brook was irrelevant to determining whether the brook is perennial. Partial Summary Decision, 10 DEPR 93, 95-96 (May 2, 2003).

As a consequence, the observations that Junction Brook at its Pleasant Street end had gone dry could not be discounted and therefore at least the lower portion of Junction Brook was intermittent. But did that mean that the entire brook was intermittent? No evidence had been presented that the upper portion of the brook runs dry. The only evidence was that the brook loses flow as it proceeds downhill. Therefore, the possibility existed that the stream flowed perennially at its head but intermittently by the time it reached the bottom of the hill. I concluded that the Regulations contemplated the possibility that a perennial stream was not necessarily perennial for its entire length. 10 DEPR at 97. I therefore scheduled a hearing to consider whether the upper portion of Junction Brook is perennial and, if so, where the boundary lies between the intermittent and perennial sections of the brook.³

Prior to the hearing, the parties stipulated that "[t]he stream has been observed dry for a distance of 200 feet above (north of) the Pleasant Street headwall. . . . There are no recorded observations of the stream dry between Main Road and the point that is approximately 200 feet north of or above Pleasant Street, i.e., the first 600 feet of the stream."

At the hearing on September 18 and 19, 2003, the witnesses testifying for petitioners were Suzanne Bass, a vice president of the Belmont Citizens Forum, long time Belmont residents Sumner Brown, Murray Ruben, Nancy Davis, Barbara Passero, and petitioner Martha Eakin, Roger Wrubel, the director of Audubon's Habitat Wildlife Sanctuary in Belmont, and Denis D'Amore, a professional engineer with a Ph.D. in geology.

Testifying for McLean were three of its employees, Andrew Healy, its Director of Facilities, Thomas Gallagher, who works in its Buildings and Grounds Department and was formerly a private security guard at the site, and Alexander MacPherson, a mechanic and equipment operator. Glen Clancy, the Belmont Conservation Commission management liaison, and Francis DiPietro, a professional engineer and project manager at the engineering firm of Vanasse Hangen Brustlin, Inc. also testified for McLean.

Environmental analyst Rachel Freed testified for DEP.

At the parties' request, I viewed the site on October 7, 2003.

Discussion

I. Perennial Stream Evaluation

A "river" is defined in the Rivers Protection Act, which in 1996 amended the Wetlands Protection Act, and in the Wetlands Protection Regulations as a "natural flowing body of water that empties into any ocean, lake, or other river and which flows throughout the year." M.G.L. c. 131, § 40, ¶ 14 and 310 CMR 10.58(2)(a)1. Most rivers, with a few stated exceptions, have a protected riverfront area that is the "area of land between the river's mean annual high-water line measured horizontally outward from the river and a parallel line 200 feet away." 310 CMR 10.58(2)(a)3. The perennial/intermittent distinction is critical to determining whether a stream is a river with a riverfront area. As the Wetlands Protection Regulations put it succinctly: "[p]erennial streams are rivers; intermittent streams are not rivers." 310 CMR 10.58(2)(a)1.

A. Does Junction Brook Meet the Definition of River?

1. Does it Empty into an Ocean, Lake, or Other River?

Before evaluating the evidence of perenniality, I turn first to two arguments McLean makes that might obviate the need for such an evaluation. McLean contends that, even if the upper reaches of Junction Brook flow perennially, it cannot be a perennial stream because of where the water flows next. Relying on the river definition I cited at the outset of this discussion, which provides that a river "empties" into an "ocean, lake, or other river," 310 CMR 10.58(2)(a)1, it argues that the upper portion of Junction Brook flows into the intermittent lower portions of the brook and then into a culverted section of Wellington Brook, neither of which are an ocean, lake, or river.

I have previously addressed the argument that a perennial stream cannot, by definition, flow into a downstream intermittent section. I concluded that the word "empties" on which McLean relies refers to the type of waterbody into which a river ultimately discharges, not to changes in the nature of the stream during the course of its run. Matter of Eakin, Partial Summary Decision, 10 DEPR at 97, and Matter of Winter, Recommended Final Decision, 10 DEPR at 109.

In this instance, the upper reaches of Junction Brook "empty," not into the intermittent section of the brook, but ultimately into Wellington Brook. It is true that Junction Brook discharges into a culverted section of Wellington Brook and that neither the Belmont Conservation Commission nor DEP has determined Wellington Brook to be a river at this point. But the status of the culverted section of Wellington Brook is irrelevant. The Regulations provide that when "a river runs through a culvert more than 200 feet in length, the riverfront area stops at a perpendicular line at the upstream end of the culvert and resumes at the downstream end." 310 CMR 10.58(2)(a)3. In order then to figure out into what type of waterbody Junction Brook empties, attention must turn to the downstream end of the culvert. The culvert system runs for about three quarters of one mile between the discharge point of Junction Brook and the downstream end of the culvert. There is no dispute that at the point where the culvert ends, Wellington Brook is a perennial stream. Indeed, the Belmont Conservation Commission found it to be so in other cases. Junction Brook therefore empties ultimately into a river.

2. Is Junction Brook a Natural Flowing Body of Water?

McLean's engineering witness, Francis DiPietro, made a different type of definitional argument. At the end of his testimony, he contends that Junction Brook cannot be a river because it is not a "natural flowing body of water." See 310 CNR 10.58(2)(a)1. This point was not the subject of cross-examination at the hearing or argued in the post-hearing briefs, but because it is potentially significant, I address it.

The Wetlands Protection Regulations do not define "natural." I assume DEP meant the ordinary meaning of natural, which refers to something "existing in or formed by nature (as opposed to artificial)." The Random House Dictionary of the English Language 952 (1967). But the Regulations also demonstrate that DEP is well aware that after hundreds of years of development, Massachusetts rivers do not arise in pristine wilderness. When discussing human activities that alter stream flow, the Regulations mention the impact of "withdrawals of water supply wells" and "direct withdrawals." 310 CMR 10.58(2)(a)1.c. They leave out a myriad of other human influences on water flow known to DEP, including drainage and sewer systems, impervious surfaces, and storm water control devices.

Since DEP knows that river flow is impacted by human actions, what then do the Regulations mean when they say a river is a "natural flowing body of water?" A hint comes from the description in the Regulations of the headwaters of a river: "[r]ivers begin at the point an intermittent stream becomes perennial, or at a spring or a pond which discharges throughout the year." 310 CMR 10.58(2)(a). Rivers thus begin with another "natural" water source (even if that source is influenced by human activities) and continue on as "natural" water bodies themselves.

In this instance, there is not question that at one time Junction Brook had purely natural sources, including one of the sources mentioned in the Regulations, a spring. Its spring and wetland sources are no more, but the stormwater runoff and groundwater that used to feed the brook still do, although now conveyed by pipes. Because the source of the water flowing in Junction Brook is natural, I conclude that the river definition in the Regulations does not preclude the possibility that Junction Brook could be a river. Nonetheless, the extensive human alteration of the brook's headwaters makes the determination of its status more difficult than if its headwaters were in a more "natural" state.

B. Evaluation of the Evidence

But, turning to the evaluation of the evidence, the more immediate difficulty for the petitioners is that they start out with two strikes against them under the regulatory approach for determining perennality. The Wetlands Protection Regulations provide that a party can attempt to demonstrate that a stream assumed to be intermittent because it is not shown on the latest U.S.G.S map for the area is in fact perennial by introducing evidence "of a stream order of two or greater" or a "watershed size of greater than three square miles." See 310 CMR 10.58(2)(a)1.a.1.4 Neither of these is the case here. A stream with an order of two or greater has tributaries feeding it; Junction Brook has none. Junction Brook's watershed is by one estimate only six acres. The minuscule size of this watershed convinced both DEP and the Belmont Conservation Commission that Junction Brook is not perennial.

But all is not lost for petitioners. The Regulations allow the consideration of other relevant evidence. See 310 CMR 10.58(2)(a)1.a.i. Petitioners rely on the well-defined nature of the brook channel, an undated map of the site purportedly showing the brook as perennial, an evaluation of the groundwater that feeds the brook, and observations by a number of witnesses over a number of years in all seasons that the brook does not cease its flow. When all is said and done, despite the obstacles in their path, petitioners put on a strong case that Junction Brook is perennial,

with some help from McLean. McLean introduced evidence that the watershed for the brook is 0.5 square miles, not a mere six acres, and that the brook flowed throughout 2003. Petitioners' groundwater analysis, coupled with frequent random observations by its witnesses and observations by one of McLean's witnesses in key later summer months tend to demonstrate that the brook also flowed perennially in 2002, a year in which the rainfall was typical.

1. Nature of the Stream Channel

Not all of petitioners' evidence is compelling. The nature of the brook channel was first mentioned by wetland scientist Patrick Garner in an April 12, 2001 letter to the Belmont Conservation Commission as a factor tending to demonstrate that Junction Brook is perennial. In the letter, Garner, who was working on behalf of Martha Eakin, stated that:

there is a cohesive and relatively deep flow channel throughout the stream system. Importantly, the channel itself is incised. Using Rosgen's classification⁵ for this stream, the brook is a type A3 river, characterized as a steep, deeply entrenched, and confined channel. These streams are rarely intermittent, with morphology typical of perennial conditions and strong flows.

Garner did not testify at the hearing, but petitioners' witness Denis D'Amore, an engineer and a geologist, adopted his analysis.

The Regulations place some importance on the nature of a stream channel. They provide that the "absence of a channel or banks" may be used to prove that a stream is intermittent." See 310 CMR 10.58(2)(a)1.a.ii. By implication, the presence of a defined channel or banks may help demonstrate the opposite.

No one disputes that the upper brook channel is incised. The significance of this fact is disputed. While an incised stream channel may in many instances be evidence of flow throughout the year that creates and maintain the channel, I am not convinced that is the case here. The parties agree that groundwater provides the baseflow for Junction Brook, but they also agree that stormwater runoff provides most of the volume of flow in the brook. If the brook is perennial, it must be because groundwater provides a continuous, if small, amount of water throughout the year. The incised, deep flow channel is unlikely to have been created by this low flow, however. Rather, the higher volumes of fast moving runoff, which dissipate within one day after a storm according to DiPietro, more likely created the incised channel. And so, while an incised channel may in many instances be evidence that a stream is perennial, I do not find it to be probative here.

2. Mapping of Junction Brook

Petitioners introduced a map from the Middlesex County Atlas that is somewhat more helpful to their case. This undated map depicts Junction Brook as a solid line. According to D'Amore, the line is a solid blue line,⁶ which he says is the traditional way of depicting a perennial stream. Although the record does not contain a key from the atlas that would confirm that Middlesex County adhered to this approach, D'Amore asserts that the atlas used this approach, noting that it also depicted Wellington Brook, which is perennial, as a solid blue line.

Assuming that D'Amore is correct, the principal difficulty with the map is that it does not show current conditions. DiPietro estimates, based on how few McLean buildings are shown on the site, that the map dates from the early 20th century. The McLean buildings that are presently near the top of the brook, including Higginson House, are not shown on the map. Although the map does not depict wetlands, I assume from the lack of buildings in the area that the wetlands and spring that were the headwaters of Junction Brook and were depicted in late 19th century maps of the area were still in existence. If so, then what the map shows about that time period is that the wetland and the spring in their original condition provided enough water to Junction Brook to convince at least one map maker that the brook was perennial. But it is the current condition, in which the spring and the wetland no longer exist, that controls this case. At most, what the map suggests is simply the potential that the water that once fed the spring and the wetland is still there somewhere and that there may be a sufficient amount of it ending up in Junction Brook to make the brook perennial.

The situation has changed so drastically, however, as to render conclusions drawn from an old map of little use. Soil borings that an engineering firm performed for McLean in the Higginson parking lot, where the wetland used to be, show that the soil under the lot is mostly fill, and not the original wetland soils. While there is groundwater in this fill, none of the witnesses suggested that groundwater levels under the parking lot are nearly as high as they would have been in the wetland or that the manner in which groundwater from under the lot feeds the brook now is the same as it was when water from the wetland fed the brook.

The parties agreed that the water that once created the spring must have come from somewhere on the McLean site that is at a higher elevation than the spring, for it is the water pressure created by the difference in elevation that

causes water to "spring" from the ground. D'Amore and DiPietro identified different areas on the McLean grounds as possible sources of the spring, but they agreed on the mechanism by which water must have traveled to the spring, namely through bedrock fractures. Presumably, absent some change, that water would still be flowing in the direction of the spring and would ultimately feed the brook. It is not at all evident that this is the case, however. The water level in the well where the spring once was is higher than the water level observed in a nearby catch basin,⁷ but how water enters into this well is not clear from the testimony, and by all accounts it does not spring. D'Amore testified that water transport through bedrock could have been disrupted by building construction or blasting. While the evidence does not make clear exactly what happened to the water that fed the spring, most likely there has been some, if not a considerable, disruption of such flow.

3. Groundwater Analysis

Ultimately, when trying to determine whether Junction Brook is perennial now, it is more important to examine how water flows to the brook today than to try to determine how that flow changed over time. On this score, there is considerable evidence favoring petitioners' position. Petitioners emphasize that groundwater presently provides the baseflow for Junction Brook. This point is uncontested, but by itself does little to demonstrate that the brook is perennial rather than intermittent because, as petitioners' witness D'Amore testified, all East Coast streams are groundwater fed. Although petitioners' position is not as clear as it might be, I do not take them to be arguing that Junction Brook is perennial merely by virtue of being groundwater fed. Rather, I understand them to be arguing that groundwater at the site provides sufficient water throughout the year to make natural perennial flow possible.

a. Sources of Groundwater Flow

To reach to Junction Brook, groundwater must enter McLean's stormwater drainage system. The drainage system drains areas of the McLean site that would otherwise generate groundwater flow toward Junction Brook. DEP and the Belmont Conservation Commission found that Junction Brook has a six acre watershed. Although neither explained how that figure was calculated, I assume it refers only to that portion of the McLean site that would drain downhill toward Junction Brook, namely the Higginson parking lot and its immediate environs. The drainage system under this lot is not independent of the rest of McLean's stormwater drainage system. Not only does groundwater from the Higginson parking lot area flow through the drainage pipes to Junction Brook, but according to DiPietro, the pipes that feed the brook drain an area of 0.5 square miles.

This is not nearly the watershed size that DEP considers the minimum necessary to support a perennial stream under normal conditions. The fact that groundwater is piped to the brook may have bearing on whether this watershed can support a perennial stream, however. Groundwater enters McLean's drainage system in as many as three ways. Underdrains located beneath the Higginson parking lot (and presumably under other hospital parking lots) are designed to draw off groundwater before it can rise, freeze, and undermine the pavement. None of the witnesses knew the exact depth that the underdrains were laid, but McLean's engineer DiPietro estimated they were placed between two and four feet underground. He said they also must be above the storm drains so that any groundwater captured in the underdrains would flow downhill to a storm drain and be drawn off that way.

Whether the underdrains beneath the Higginson parking lot are functioning is uncertain. An earlier engineering study performed for McLean found the underdrains blocked, which DiPietro testified could have occurred naturally over time as soil accumulated in them. D'Amore questioned whether the underdrains could really be blocked, for if they were, the parking lot would flood.

Whatever the truth about the functioning of the underdrains below the Higginson lot, there is likely at least one other type of structure that regularly draws groundwater into the drainage system. DiPietro testified that typically when a building is constructed on a hillside, as those at McLean are, "footing drains" are installed on the uphill side of the building to draw off ground water. He believes that clear groundwater drawn off by such footing drains was the source of water flowing in a catch basin that he and D'Amore observed on June 26, 2002.

Finally, there are the storm drains themselves. DiPietro testified that storm drains are not built to be as water tight as sewer lines, because if water were to enter them, it would simply drain away. He stated that water likely enters the storm drains at leaks around the pipe joints.

How then does the manner in which groundwater is piped to the brook bear on the issue of whether the brook is perennial? On the one hand, it is conceivable that groundwater levels are always above some element of the drainage system, and hence groundwater may enter the drains and the brook throughout the year. On the other hand, DiPietro testified that during the summer "the water table is below major portions of the drainage system that underlies Higginson parking lot," suggesting that in months when groundwater levels are lowest, the brook may be deprived of groundwater infiltration. But because the record lacks information about the exact depth of the elements

of the drainage system and contains very little evidence on groundwater levels, a broad conclusion cannot be drawn easily.

b. D'Amore's Flow Study

The most detailed information about the interaction between groundwater and the drainage system comes from a study performed by D'Amore in 2002. Between June 26 and July 30, 2002, D'Amore measured the amount of water flowing at the top and the bottom of Junction Brook on six separate days, chosen because they were not near rainy days so that the measured flow would be strictly groundwater. For the last three weeks of July 2002, he also took weekly measurements of the water table levels in a monitoring well installed in the Higginson parking lot. On June 26, 2002, water flowed at the rate of 30,000 gallons per day (gpd) at the top of the brook; that flow was reduced to 10,000 gpd by July 30. During the same period, flow at the bottom of the hill fell from 22,000 gpd to 2,400 gpd. Groundwater levels dropped only slightly, from 3.57 feet to 3.8 feet below ground. The rainfall data introduced shows that 2002 was a fairly typical year, with rainfall in the spring and summer around the overall average.

Extrapolating from the data he obtained, D'Amore predicted that the bottom of the brook would dry up by the end of August 2002, but the brook at the top would continue to flow throughout August and September. If he was right, the brook flowed at the top of the hill throughout the driest period of the year and therefore more than likely flowed throughout the whole year. And since the year was fairly typical, his analysis may predict as well that the brook flows perennially year after year.

Both McLean and DEP question the reliability of D'Amore's extrapolation. McLean objects that he relied on an extrapolation with few data points instead of measuring water flow in August and September 2002. D'Amore testified that he was willing to continue his work until later in the summer, but that McLean insisted the work stop when its Director of Facilities, Andrew Healy, went on vacation. In light of this, I will not consider an objection from McLean that appears to protest a problem of its own creation.

McLean also notes that in early August 2002, DiPietro saw the brook run dry at its base, contrary to D'Amore's prediction that it would not dry up until the end of the month. I agree that this calls D'Amore's extrapolation partly into question, but only regarding his estimate of when the brook would dry up at the bottom of the hill. The flow loss during July 2002 that the brook experienced between its top and its bottom varied from 7,118 to 9,679 gpd. D'Amore took the average loss and used that to predict when the brook would dry up at its base. But the data that D'Amore gathered provides no reason to believe that the stream would behave in an average fashion. The water loss over the one month period was entirely random. The amount of loss was not related to the strength of flow or to the time of the month. Thus, if on any given day an average loss were predicted, the actual loss could vary considerably from it and could cause the stream to go dry.

D'Amore's extrapolation of flow at the top of the brook does not suffer from this problem. Rather than using flow averages, he used the actual flows measured on each occasion to predict what flows would occur during the next two months. DiPietro's observations, which call into question the validity of D'Amore's predictions of flow at the bottom of the hill, help to confirm the validity of D'Amore's prediction that flow at the top of the hill would continue unabated. DiPietro visited the site about twenty times during August and September 2002. He never saw the brook cease to flow at the top on any of these visits.

DEP criticizes D'Amore's method as unrecognized. DEP analyst Rachel Freed asked other DEP staff and members of the U.S. Geological Service if they had heard of such a method and they had not. Freed also asserts that the most reliable indicator of whether a stream is perennial is the size of its watershed.

If experts in a field have examined the reliability of a predictive method and rejected it, then I would doubtless reject it as well. But if those in the field have simply not heard of it before, that is less telling. I assume that science continues to progress and that new methods are developed frequently. That D'Amore's method is evidently new does not make it unusable. He relies on what appears to be a typical approach in mathematics and science: take data and use them to develop a mathematical curve.

The general predictive value of watershed size — one written into the Regulations — does not make D'Amore's results unworthy of consideration. Watershed size may be of great value in attempting to determine as a general matter whether a stream is perennial. But the Regulations do not treat watershed size as the only factor to be considered. Presumably, this is because streams of equal watershed size can behave differently. And in this instance, where the means by which water is conveyed from the watershed to the brook is unusual, examining the stream flow characteristics themselves may be of use. The data D'Amore acquired comes from a dry month of a typical year and provides information that is helpful in determining whether Junction Brook is perennial. Using these data, D'Amore

predicted accurately that the brook would continue to flow in August and September 2002 when he was not there to observe it (but DiPietro was).

If the parties had not limited themselves to challenging D'Amore's method generally and had instead looked closely at the validity of his conclusions, they might have pursued significant substantive questions about his work. How was it that the water flow at the top of Junction Brook fell by two thirds in July 2002 and yet D'Amore concluded it would not go dry in the two dry summer months that followed? And what can be made of the minuscule drop in groundwater level? Is it proof that the groundwater level at McLean falls little during the summer and therefore that groundwater will be available for streamflow? Or is it, instead, proof that when groundwater has fallen to a certain level, even a tiny decrease in the groundwater level will cause a dramatic decrease in streamflow?

Since only the petitioners addressed the specific meaning of the data, I am left with only their analysis. Because D'Amore's data are unchallenged, his method is based on a standard mathematical approach, and no one questions the calculations he made to derive his curve, I accept that his work proves it likely that, at least in 2002, Junction Brook did not run dry during the driest months of the year. DiPietro's observations support this conclusion.

c. Streamflow Observations

Finally, petitioners rely on observations of stream flow in Junction Brook to support their case for perennial flow. These are countered by observations of no flow made by McLean's witnesses. The Regulations list observations that a stream is not flowing as one form of proof that a stream is intermittent. See 310 CMR 10.58(2)(a)1.a.ii. By implication, observations that a stream flows throughout the year would be evidence that a stream is perennial. Under the 1997 Regulations, if a stream ceases flow one day per year, it is considered intermittent, which makes proof for those attempting to demonstrate that a stream is intermittent far easier than proof the other way. See *North Shore Custom Homes*, Docket No. 2000-050, Recommended Final Decision, 9 DEPR 142 (May 21, 2002), adopted by Final Decision, 10 DEPR 14 (January 29, 2003) and *Matter of Corey*, Docket No. 2000-189, Recommended Final Decision (December 24, 2001), adopted by Final Decision, 9 DEPR 9 (January 11, 2002). For that reason, I will focus more on testimony regarding a lack of flow because one credible observation of no flow will prevail over frequent credible observations of flow.

Flow or the lack of it is not easily observed at the top of Junction Brook. The witnesses who made stream observations did so from two hillside paths. One path at the top of the hill runs just west of the brook before veering off into the woods and can be accessed from Main Road. The brook cannot be seen from the path itself because of the depth of the pool into which the water flows initially. Anyone wishing to see the brook must step off the path a few feet in the direction of the pool. When the brook is flowing, it can be heard from this path. The other path, which the witnesses called the "Coal Road," cuts through the woods and crosses the brook at the base of the hill. The bottom of the brook can be observed readily in a clearing there, but not the top of the brook, for the forest and other vegetation (including reportedly poison ivy) are too dense near the brook itself to permit observation for any distance uphill.

None of the witnesses made a written record of any stream observations. Despite efforts to shake them from their testimony, the witnesses for both petitioners and McLean by and large held up well under cross-examination. They all testified to specific and sometimes frequent observations of flow or no flow and each presented a credible reason to believe he or she was in a position to observe flow at the top of the brook.

Petitioners' observation witnesses (Barbara Passero, Roger Wrubel, Murray Ruben, Martha Eakin, and William Sumner Brown) made a habit of walking, or in the case of Brown running, through the hospital grounds along paths that brought them in the vicinity of the top of the brook, and each testified credibly about personal efforts to observe flow at the top. Although no expertise is needed to observe whether a stream is flowing, some of petitioners' witnesses have special training in field work that adds credibility to their observations of the brook's flow characteristics. Passero has written educational material on the marine and coastal environment; Wrubel is director of Massachusetts Audubon's Habitat Wildlife Sanctuary in Belmont. Brown, who is an engineer, testified that on a number of occasions when he ran down the Coal Road in August and September 2001, he deliberately went to the top of the brook to see if there was any difference in flow at the top depending on whether the brook was flowing at the bottom or not. He observed no difference. Similarly, D'Amore observed the following year no relationship between stream flow at the top and the amount of water lost over the brook's run.

McLean's witnesses all work at the site. Andrew Healy, McLean's Director of Facilities, walks the hospital grounds once or twice per week, and during these walks occasionally takes the path adjacent to the top of the stream. Thomas Gallagher, who now works in the Buildings and Grounds Department, used to work for a private security firm. He patrolled the grounds when he was a security guard, including the area of Junction Brook, and on occasion searched for missing patients who might be hiding in the brook. Alexander MacPherson is an equipment operator for McLean

and has, in the late summer, cleared the path adjacent to the top of the brook of fallen limbs or other debris.⁸ Sometimes this work took a few days.

Having said that the observation witnesses for both sides were by and large credible, I am left with a conundrum for their testimony cannot be reconciled easily. It is always possible that the witnesses were looking at the brook on different days. While that is undoubtedly true for some of the observations, it cannot explain them all. If one adds up the number of visits to the brook made by the witnesses for each side, one discovers that it is possible that petitioners's witnesses visited the brook about half the days of the month and so did McLean's witnesses. There was bound to be some overlap. Healy, in particular, was adamant that the brook dried up for weeks at a time in the late summer. This testimony cannot be reconciled with petitioners' testimony by assuming Healy's observations occurred on different days.

Some of the observations occurred in different years. That explains very little, however, because most of the testimony focused on observations made in the late 1990s and the early years of this century.

DiPietro suggested a potential solution. He testified that he visited the brook both early in the morning and toward the end of the day. He noticed that flow was different at these times; in particular, flow stopped higher up the hill on a summer day as the day wore on. He consulted with environmental scientists at his firm and was told this phenomenon was likely due to an increase in evapotranspiration as trees sucked up more groundwater during hot daylight hours. It is possible, then, that under certain conditions the brook flows at the top in the morning but ceases such flow later in the day. It is also possible that petitioners' witnesses took their walks in the morning and McLean's witnesses made their observations in the afternoon. No times were given for most of the observations, however. Therefore, I cannot determine whether the time of day influenced what the witnesses saw.

I am left then with some irreducible conflict in the evidence. The most likely conclusion is that in some years the brook flows throughout the year and in other years it does not. The careful observations made by D'Amore and DiPietro in 2002 demonstrate that the brook flowed throughout that year. Healy also testified that the brook did not cease its flow in 2003. Hence, in two recent years the brook flowed perennially.

But, I also accept the testimony of McLean's witnesses that the brook ceased to flow in 1998, 1999, and 2000. On this point, the witnesses corroborate each other, Healy testifying to lack of flow in 1998 and 1999 and Gallagher and McPherson testifying to lack of flow in 1998-2000.

Healy's description of the brook when it was not flowing makes it appear far drier than anyone else described it, but this does not undermine his testimony. It is clear from his testimony that he was close enough to the brook to see whether it was flowing. The variations in description may simply be attributed to the vagaries of language used to describe what was observed. If the top of a rock over which one would have to walk to get close to the pool is dry, but there is some water around it, one person may describe this scenario as dry, another as wet.

Petitioners argue that McPherson's testimony that he drove heavy equipment onto the path adjacent to the brook is incredible because of the narrowness and steepness of the incline off of Main Road. They suggest that McPherson was in fact working on a broader nearby path that is a little farther from the stream. McPherson did not say, however, that he drove heavy equipment directly off of Main Road to get to the path closest to the brook, and how he got the equipment to the work site or how close that was to the stream is of no great importance. What is important is that he was working close by the stream for many hours over the course of a few days and that at some point during these days, if he failed to hear the brook flowing, which all the witnesses agree is a sound easily heard, he went close enough to the brook to see whether it was flowing or not.

Gallagher saw the brook in two types of situations while working as a security guard, the first during his regular rounds of the McLean campus and the second while looking for missing patients. For some of the observations he made during his regular rounds, he concluded that the brook was not flowing because he did not hear it. Given the testimony of the other witnesses on the subject and the steepness of the incline over which the brook flows at the top, he is no doubt correct that ordinarily if the brook is flowing it can be heard. I am unwilling, however, to accept that the absence of sound emanating from the brook is definitive proof that it was not flowing because it is conceivable that at very low flow the brook could be inaudible.

I find his testimony more persuasive concerning his observations during patient searches. It could be objected that the focus of Gallagher's attentions at these times would most likely have been on the patient and not on flow conditions in the brook. But Gallagher's descriptions of what he saw when he entered the pool (a potential hiding place for a missing patient) are detailed and clear. I therefore credit his testimony that on a number of occasions he saw no water flowing out of the pipes that feed the brook.

Having found that Junction Brook flows throughout the year during some years but not others, I conclude that because of the way in which the Regulations define perennial stream, Junction Brook is not perennial. The Regulations expect perennial streams to flow throughout the year except in times of extended drought. See 310 CMR 10.58(2)(a)1.c. There is no evidence that there was an extended drought affecting flow in the summers of 1998, 1999, or 2000. Hence, because I have found that the brook ceased flow sometime during those summers, I must also find that it is intermittent.

II. Intermittent Stream Analysis

I do not find it to be an intermittent stream, however. A stream that flows intermittently is considered a stream for purposes of the Wetlands Protection Regulations "except for that portion upgradient of all bogs, swamps, wet meadows and marshes." See 310 CMR 10.04. Petitioners alleged initially on appeal that Junction Brook has bordering vegetated wetlands associated with it, which if true would mean that at least the brook meets the regulatory definition of intermittent stream. But petitioners dropped that claim prior to hearing, and consequently that issue was not tried.

Some of the testimony introduced at the hearing might have had a bearing on that issue. D'Amore asserted that the source of water for the spring that used to feed Junction Brook was a red maple swamp at the northeastern end of the property. This claim was questioned by McLean because surface water from the swamp drains west, rather than south toward the brook. But D'Amore testified that the bedrock in this area has fissures that run north/south, and hence groundwater in the swamp could travel through the fissures to reach the spring. Although DiPietro suggested another possible location for the source of the spring's water, I am inclined to think that D'Amore, who has far more expertise in geology, is more likely correct.

This matters to the present analysis because, if the brook is still being fed by groundwater from the red maple swamp, then it meets the intermittent stream definition. But as I noted in my earlier discussion of the spring, the record is not clear on what happened to groundwater that fed the spring. D'Amore performed no tests to determine if groundwater from the swamp was still feeding the brook. In the absence of some proof that the swamp is a present source of the brook's water, I cannot find that Junction Brook is an intermittent stream.

Conclusion

After a hearing, I conclude that Junction Brook, on the McLean Hospital campus, is not a river because in at least some years it flows intermittently. I also conclude that Junction Brook is not an intermittent stream as defined in the Wetlands Protection Regulations because the evidence does not establish that it flows out of or through a bog, swamp, wet meadow, or marsh. I therefore affirm the superseding determination of applicability issued by DEP.

Notice

This decision is a recommended final decision of the administrative magistrate. It has been transmitted to the Commissioner for his final decision in this matter. The decision is therefore not a final decision subject to reconsideration under 310 CMR 1.01(14)(d), and may not be appealed to Superior Court pursuant to M.G.L. c. 30A. The Commissioner's final decision is subject to rights of reconsideration and court appeal and will contain a notice to that effect. Because this matter has now been transmitted to the Commissioner, no party may file a motion to renew or reargue this recommended final decision or any portion of it, and no party shall communicate with the Commissioner's office regarding the decision unless the Commissioner, in his sole discretion, directs otherwise.

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1. The method discussed in this decision for resolving whether a stream is intermittent or perennial is the one set forth in the Wetlands Protection Regulations effective October 7, 1997. DEP substantially revised its approach in Regulations it issued on December 20, 2002. The revised Regulations do not apply to a request for determination, such as this one, that was filed before December 20, 2002. See 310 CMR 10.10(11)(rev. December 20, 2002). I refer throughout this decision to the 1997 version of the Regulations, unless noted otherwise.

2. The Commission expressed some confusion about an earlier decision of mine, *Matter of Phillip Rice*, Trustee, Bradford Circle Trust, Docket No. 99-034, Final Decision, 7 DEPR 117 (September 13, 2000). The Wetlands Protection Regulations provide that when an issuing authority, be it a conservation commission or DEP, is to decide whether a stream is intermittent or perennial, it must first look at the information provided about the stream by U. S. Geological Survey maps. If the latest U.S.G.S. map shows the stream as perennial, the issuing authority must presume the stream is perennial until such time as evidence from a competent source is presented to the contrary. 310 CMR 10.58(2)(a)1.a and 310 CMR 10.58(2)(a)1.a.ii.. The Regulations similarly require that if the U.S.G.S. map shows the stream as intermittent or does not show it at all, the issuing authority shall treat it as intermittent until competent contrary evidence is presented. 310 CMR 10.58(2)(a)1.a.i. In this latter instance, the Regulations do not use the word presumption. In *Matter of Rice*, I did use the word presumption to describe how an issuing authority is to treat the situation when a U.S.G.S. map shows a stream as intermittent or does not show it at all. 7 DEPR at 121. The Commission believes that the *Rice* decision raises the bar on those who would challenge the initial assumption that a stream is intermittent based on a U.S.G.S. map. In its decision, it stated, "the Commission will not elevate the importance of the [U.S.G.S.] map to a presumption of an intermittent stream."

To clarify, *Matter of Rice* does not change the standard set forth in the Regulations. The Regulations simply require that an issuing authority begin its analysis of a stream's status by looking first at the U.S.G.S. map. While the Regulations use the word "presumption" when the U.S.G.S. map shows a stream as perennial and do not use that word when the map shows otherwise, these two situations are exactly parallel and the standard is the same under either of them. In each instance, the issuing authority starts with the U.S.G.S. map and then moves on if evidence is presented that contradicts the map.

The word "presumption" in this context has no talismanic force. What the Regulations describe in both instances, whether they use the word or not, is a rebuttable presumption. In American jurisprudence, a rebuttable presumption means only that a fact finder under specified circumstances is to presume a certain fact is true even though no evidence has been presented to establish that fact or, more relevant here, when only one piece of evidence - the U.S.G.S. map - has been presented. See, e.g., *Jacobs v. Town Clerk of Arlington*, 402 Mass. 824, 827, 525 N.E. 2d 658, 660 (1988)(person missing for seven years presumed dead). Because the presumption is rebuttable, once any other relevant, material evidence has been presented, the presumption goes away and the fact finder must then analyze the facts actually presented to determine what fact has been proved. *Jacobs*, 402 Mass. at 828, 525 N.E.2d at 661(the "presumption of death in this case ... disappeared when controverting evidence appeared").

In this instance, that is exactly what the Commission did. It examined the U.S.G.S. map for the area and noted that the map did not show Junction Brook at all. It therefore started by treating Junction Brook as intermittent until evidence was produced that it is perennial. When that evidence was presented, the Commission analyzed it and made a finding based on the facts presented to it. The U.S.G.S. map was one of those facts, but once the presumption had gone away, the Commission need not have given the map any more weight than it deserved. Here, the Commission found that the map deserved little weight. It failed to show Junction Brook, although maps at least one century old showed it. It also failed to treat Wellington Brook as perennial, although the Commission had already found it to be so.

3. I reached the same conclusion that a perennial stream could have intermittent sections in *Matter of Winter*, Docket No. 2002-010, Recommended Final Decision, 10 DEPR 104 (May 15, 2003). The Commissioner accepted my regulatory analysis, but cautioned that the situation in which a stream is perennial, then intermittent, then perennial again "will occur only in unusual or abnormal circumstances." Final Decision, 10 DEPR 181 (August 11, 2003).

The stream in *Winter* is a substantial perennial stream for miles, but the geology of its streambed changes and it begins to lose water, so much so that it occasionally dries up although continuing to flow upstream. Junction Brook is also a water-losing stream, but the cases do not present the same question. In *Winter*, I found that the portion of the stream that is a losing stream is intermittent. Here, in contrast, petitioners argue that Junction Brook, although it is a losing stream, is nonetheless perennial.

4. Under the 2002 Regulations, DEP allows for the possibility that a stream with a watershed size of at least 0.5 square miles is perennial. One way of showing this is by demonstrating that the surficial geology of the drainage area contains 75% or more stratified drift. See 310 CMR 10.58(2)(a)1.c.ii (rev. 2002). That would be of no help to petitioners because the geology of the site is far different. As described by D'Amore, the hill on which McLean sits is bedrock covered by a thin veneer of glacial till.

5. Neither Rosgen nor his stream classification scheme are identified further in the record.

6. The photocopy submitted into evidence is not in color.

7. DiPietro asserted that the difference in water levels between the well and the catch basin demonstrates that the well is not connected to water table in the parking lot and thus provides no water to the brook. D'Amore disputed this based on a memo prepared for McLean for another purpose that discussed pipes leading away from the well. I am inclined to agree with DiPietro that the difference in water levels demonstrates that any pipes associated with the well are not taking water from it to the storm water drainage system. But I fail to see how this necessarily answers the underlying question of what happened to the water that once fed the spring.

8. Katherine Wilkie, a landscape architect with Pressley Associates, was the project manager for McLean's effort to develop a master plan for reuse of this site. One of her tasks was to map the watercourses on the site. Sometime in late July or August 1997, she saw Junction Brook run dry from the top to the bottom. She asked Healy to verify this and he saw the same thing.

I will not consider this observation here because there is evidence in the record that Belmont was experiencing an extended drought at the time. Under the Regulations, "[r]ivers include perennial streams which are dry during periods of extended drought." 310 CMR 10.58(2)(a)1.c. If Belmont had been in a period of extended drought, it would have made observations that Junction Brook ran dry - like Wilkie's - less important and potentially irrelevant. One of the things that must be shown in order to demonstrate the existence of an extended drought is "precipitation for the four previous months [that is, previous to an observation of a stream running dry] was below normal for the period of record." 310 CMR 10.58(2)(a)1.c. In one of the four months before late July and early August, precipitation in Belmont was 137% of normal. Petitioners submitted a memorandum by engineer and Commission member Kathleen Baskin to the chairman of the Commission in which she discussed the view of those who thought each month had to have below normal precipitation to count as an extended drought and the contrary view that if, on average, precipitation was below normal for the four months, the community was in an extended drought. In her memo, she relates a conversation she had with a member of DEP's wetlands staff who told her that DEP's position was to average the precipitation for the four months.

I have not been asked to decide whether there was an extended drought in Belmont eight years ago or to revisit the Conservation Commission's apparent conclusion that there was not. Given the wealth of other observation testimony in the record, there is no need to attempt to sort these matters out.

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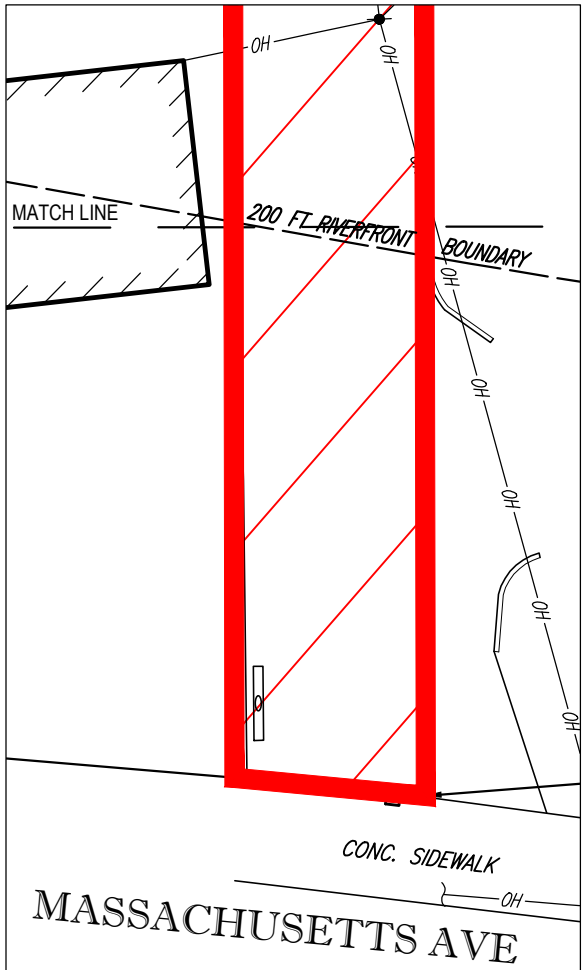


EXHIBIT

TOTAL ON-SITE
RIVERFRONT AREA
24,355± SF (0.56 Ac.)

APPROXIMATE MILL COMPLEX
FOOTPRINT AREA
BASED ON RECORD PLANS PRIOR
TO 1946
76,976± SF (1.77 Ac.)

WORKBAR AREA TO BE
SUBDIVIDED FROM
PROJECT SITE



DRIVEWAY TO
MASSACHUSETTS AVENUE
SCALE: 1" = 20'

PLAN REFERENCE:
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ASSOCIATES, INC. DATED APRIL 6, 2020

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PLAN DOCUMENTS

FOR

1165R MASS MA
PROPERTY LLC

PROPOSED
RESIDENTIAL DEVELOPMENT
1165R MASSACHUSETTS AVE.
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MAP #57, BLOCK #2, LOT #10B
AND PART OF LOT #15

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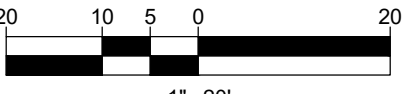
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SHEET TITLE:
**PRE-1946 MILL
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FOOTPRINT
EXHIBIT**

SHEET NUMBER:

EC-2

ORG. DATE - 08/07/2020



MEMORANDUM

To: Arlington Conservation Commission
From: Nathaniel Stevens
Date: September 30, 2020
Re: 1167R Mass Ave RDA – “Stream” definition in 310 CMR 10.04

In 310 CMR 10.04 [\[PDF\]](#), a “stream” is defined as:

“a body of running water, including brooks and creeks, which moves in a definite channel in the ground due to a hydraulic gradient, and which flows within, into or out of an Area Subject to Protection under the Act. A portion of a stream may flow through a culvert or beneath a bridge. Such a body of running water which does not flow throughout the year (i.e., which is intermittent) is a stream except for that portion upgradient of all bogs, swamps, wet meadows, and marshes”.

MACC’s Conservation Handbook, section 16.24.2.1 says “Some intermittent streams may be important in bringing stormwater flows into wetland areas, but this function is not recognized under the Act. Although entire hillsides may be drained by “upgradient intermittent streams,” these channels are not under the jurisdiction of the commission unless bordered by wetlands. This was a political decision under the 1983 *regulations* and does not relate to the importance of these streams, especially for flood control.”

Preface to 1983 Wetland Regulations (310 CMR 10.00) states:

E. Definition of “Stream”

During the public comment period the environmental community repeatedly expressed concern that under the proposed regulations intermittent streams throughout the Commonwealth would no longer be subject to jurisdiction. This has never been the Department's intention, and the definition has consequently been clarified to indicate that intermittent streams are included within the definition, except those portions that are upgradient of all wetlands. (See 310 CMR 10.04, definition of stream.) This provides a clear, practical cut-off point for distinguishing between true streams and small drainage channels which flow in direct response to precipitation.

F. Identification and Regulation of Land Subject to Flooding



Town of Arlington, Massachusetts

Notice of Intent

Summary:

Notice of Intent: Wellington Park, 35 Grove Street

MassDEP File #091-0324

This NOI was initially presented to the Conservation Commission at its 09/17/2020 meeting. This project proposes additional amenities in Wellington Park, including more native plantings, an extended 8:15pm pathway, a bioretention basin, additional signage and seating, and an informal exploration area. These additional amenities are located within the 100-ft Wetlands Buffer, Adjacent Upland Resource Area, and 200-ft Riverfront Area, and Floodplain of Mill Brook.

ATTACHMENTS:

Type	File Name	Description
☐ Notice of Intent	Wellington_Phase3_NOI_09032020.pdf	Wellington Park NOI
☐ Notice of Intent	Wellington_Park_NOI_Memo_09292020.pdf	NEW Wellington Park NOI Supplemental Memo
☐ Notice of Intent	Wellington_Park_Revised_Biobasin_Plan.pdf	NEW Wellington Park NOI Revised Plan

Notice of Intent Application

Mill Brook Corridor & Wellington Park Revitalization Phase – 3 Project Arlington, Massachusetts

2 September, 2020

Subject Property

Wellington Park
35 Grove Street
Parcel Number 54-1-1
Arlington, Massachusetts 02476

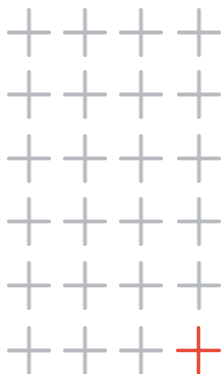
Applicant and Owner

Emily Sullivan
Town of Arlington
730 Massachusetts Avenue
Arlington, Massachusetts 02476
(781) 316-3012

Representative

Hatch
27 Congress Street, Suite 508
Salem, MA 01970
(978) 224-3122

HATCH



September 2, 2020

Reference: H/362472/100

Arlington Conservation Commission
Attn: Emily Sullivan
730 Massachusetts Avenue
Arlington, MA 02476

Subject: Notice of Intent
Mill Brook Corridor and Wellington Park Revitalization – Phase 3

Dear Members of the Conservation Commission,

On behalf of the owners, the Town of Arlington, Hatch Associates Consultants, Inc. (Hatch) is submitting this Notice of Intent (NOI) Application pursuant to the Massachusetts Wetlands Protection Act (MGL Chapter 131, Section 40) and the Town of Arlington Wetlands Protection Bylaw for the proposed renovations at Wellington Park.

Enclosed please find:

One original and seven copies of the NOI submission

We look forward to meeting with you at the September 17, 2020 Public Hearing. If you have any questions regarding this application or require additional information, please contact me at (978) 224-3110 or at andrew.keel@hatch.com.

Respectfully,

HATCH

Andrew Keel, PLA
Project Manager, Landscape Architect

Cc: DEP Northeast Regional Office

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- L-1: SITE PLAN
- L-2: PLANTING PLAN
- L-3: NATURALISTIC EXPLORATION AREA ENLARGEMENT PLAN
- L-4: BIORETENTION BASIN AND SWALE ENLARGEMENT PLAN
- L-5: BOARDWALK ENLARGMENT PLAN AND DETAILS
- L-6: SITE DETAILS
- L-7: PLANTING DETAILS

WPA Form 3 – NOTICE OF INTENT



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Arlington

City/Town

Important:

When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



Note:
Before completing this form consult your local Conservation Commission regarding any municipal bylaw or ordinance.

A. General Information

1. Project Location (**Note:** electronic filers will click on button to locate project site):

35 Grove Street

a. Street Address

Arlington

b. City/Town

02476

c. Zip Code

Latitude and Longitude:

42deg25'13.27"N

d. Latitude

71deg10'3.28"W

e. Longitude

54,55

f. Assessors Map/Plat Number

054.0-0001-0001.1,0.55B-0001-0010.0

g. Parcel /Lot Number

2. Applicant:

Emily

a. First Name

Sullivan

b. Last Name

Town of Arlington

c. Organization

730 Massachusetts Avenue

d. Street Address

Arlington

e. City/Town

MA

f. State

02476

g. Zip Code

(781) 316-3012

h. Phone Number

i. Fax Number

ESullivan@town.arlington.ma.us

j. Email Address

3. Property owner (required if different from applicant): ☐ Check if more than one owner

a. First Name

b. Last Name

c. Organization

d. Street Address

e. City/Town

f. State

g. Zip Code

h. Phone Number

i. Fax Number

j. Email address

4. Representative (if any):

Andrew

a. First Name

Keel

b. Last Name

Hatch Associates Consultants, Inc.

c. Company

27 Congress St. Suite 508

d. Street Address

Salem

e. City/Town

MA

f. State

01970

g. Zip Code

(978) 224-3110

h. Phone Number

i. Fax Number

andrew.keel@hatch.com

j. Email address

5. Total WPA Fee Paid (from NOI Wetland Fee Transmittal Form):

exempt

a. Total Fee Paid

na

b. State Fee Paid

na

c. City/Town Fee Paid



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

MassDEP File Number

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Arlington

City/Town

A. General Information (continued)

6. General Project Description:

Mill Brook Corridor & Wellington Park Revitalization - Phase 3

7a. Project Type Checklist: (Limited Project Types see Section A. 7b.)

- | | |
|---|---|
| 1. <input type="checkbox"/> Single Family Home | 2. <input type="checkbox"/> Residential Subdivision |
| 3. <input type="checkbox"/> Commercial/Industrial | 4. <input type="checkbox"/> Dock/Pier |
| 5. <input type="checkbox"/> Utilities | 6. <input type="checkbox"/> Coastal engineering Structure |
| 7. <input type="checkbox"/> Agriculture (e.g., cranberries, forestry) | 8. <input type="checkbox"/> Transportation |
| 9. <input checked="" type="checkbox"/> Other | |

7b. Is any portion of the proposed activity eligible to be treated as a limited project (including Ecological Restoration Limited Project) subject to 310 CMR 10.24 (coastal) or 310 CMR 10.53 (inland)?

1. ☒ Yes ☐ No If yes, describe which limited project applies to this project. (See 310 CMR 10.24 and 10.53 for a complete list and description of limited project types)

310 CMR 10.53(4)(e)(5) Other: Planting of vegetation to improve habitat value; fill removal and regrading; invasive species

If the proposed activity is eligible to be treated as an Ecological Restoration Limited Project (310 CMR 10.24(8), 310 CMR 10.53(4)), complete and attach Appendix A: Ecological Restoration Limited Project Checklist and Signed Certification.

8. Property recorded at the Registry of Deeds for:

Middlesex County

a. County

5718

c. Book

b. Certificate # (if registered land)

57

d. Page Number

B. Buffer Zone & Resource Area Impacts (temporary & permanent)

- ☐ Buffer Zone Only – Check if the project is located only in the Buffer Zone of a Bordering Vegetated Wetland, Inland Bank, or Coastal Resource Area.
- ☒ Inland Resource Areas (see 310 CMR 10.54-10.58; if not applicable, go to Section B.3, Coastal Resource Areas).

Check all that apply below. Attach narrative and any supporting documentation describing how the project will meet all performance standards for each of the resource areas altered, including standards requiring consideration of alternative project design or location.



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

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B. Buffer Zone & Resource Area Impacts (temporary & permanent) (cont'd)

For all projects affecting other Resource Areas, please attach a narrative explaining how the resource area was delineated.

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
a. <input checked="" type="checkbox"/> Bank	8 1. linear feet	8 2. linear feet
b. <input type="checkbox"/> Bordering Vegetated Wetland	1. square feet	2. square feet
c. <input type="checkbox"/> Land Under Waterbodies and Waterways	1. square feet 3. cubic yards dredged	2. square feet

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
d. <input checked="" type="checkbox"/> Bordering Land Subject to Flooding	2,725 1. square feet 40 3. cubic feet of flood storage lost	2,750 2. square feet 600 4. cubic feet replaced
e. <input type="checkbox"/> Isolated Land Subject to Flooding	1. square feet 2. cubic feet of flood storage lost	3. cubic feet replaced
f. <input checked="" type="checkbox"/> Riverfront Area	Mill Brook 1. Name of Waterway (if available) - specify coastal or inland	

2. Width of Riverfront Area (check one):

- ☐ 25 ft. - Designated Densely Developed Areas only
- ☐ 100 ft. - New agricultural projects only
- ☒ 200 ft. - All other projects

3. Total area of Riverfront Area on the site of the proposed project: 300,000
square feet

4. Proposed alteration of the Riverfront Area:

<u>22,780</u> a. total square feet	<u>21,250</u> b. square feet within 100 ft.	<u>1,530</u> c. square feet between 100 ft. and 200 ft.
---------------------------------------	--	--

5. Has an alternatives analysis been done and is it attached to this NOI? ☐ Yes ☒ No

6. Was the lot where the activity is proposed created prior to August 1, 1996? ☒ Yes ☐ No

3. ☐ Coastal Resource Areas: (See 310 CMR 10.25-10.35)

Note: for coastal riverfront areas, please complete **Section B.2.f.** above.



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Arlington

City/Town

B. Buffer Zone & Resource Area Impacts (temporary & permanent) (cont'd)

Check all that apply below. Attach narrative and supporting documentation describing how the project will meet all performance standards for each of the resource areas altered, including standards requiring consideration of alternative project design or location.

Online Users:
Include your document transaction number (provided on your receipt page) with all supplementary information you submit to the Department.

<u>Resource Area</u>	<u>Size of Proposed Alteration</u>	<u>Proposed Replacement (if any)</u>
a. <input type="checkbox"/> Designated Port Areas	Indicate size under Land Under the Ocean, below	
b. <input type="checkbox"/> Land Under the Ocean	1. square feet	
	2. cubic yards dredged	
c. <input type="checkbox"/> Barrier Beach	Indicate size under Coastal Beaches and/or Coastal Dunes below	
d. <input type="checkbox"/> Coastal Beaches	1. square feet	2. cubic yards beach nourishment
e. <input type="checkbox"/> Coastal Dunes	1. square feet	2. cubic yards dune nourishment
	<u>Size of Proposed Alteration</u>	<u>Proposed Replacement (if any)</u>
f. <input type="checkbox"/> Coastal Banks	1. linear feet	
g. <input type="checkbox"/> Rocky Intertidal Shores	1. square feet	
h. <input type="checkbox"/> Salt Marshes	1. square feet	2. sq ft restoration, rehab., creation
i. <input type="checkbox"/> Land Under Salt Ponds	1. square feet	
	2. cubic yards dredged	
j. <input type="checkbox"/> Land Containing Shellfish	1. square feet	
k. <input type="checkbox"/> Fish Runs	Indicate size under Coastal Banks, inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above	
	1. cubic yards dredged	
l. <input type="checkbox"/> Land Subject to Coastal Storm Flowage	1. square feet	
4. <input type="checkbox"/> Restoration/Enhancement		
If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage that has been entered in Section B.2.b or B.3.h above, please enter the additional amount here.		
a. square feet of BVW	b. square feet of Salt Marsh	

5. ☐ Project Involves Stream Crossings

a. number of new stream crossings

b. number of replacement stream crossings



Massachusetts Department of Environmental Protection
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WPA Form 3 – Notice of Intent

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Provided by MassDEP:

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City/Town

C. Other Applicable Standards and Requirements

- ☐ This is a proposal for an Ecological Restoration Limited Project. Skip Section C and complete Appendix A: Ecological Restoration Limited Project Checklists – Required Actions (310 CMR 10.11).

Streamlined Massachusetts Endangered Species Act/Wetlands Protection Act Review

1. Is any portion of the proposed project located in **Estimated Habitat of Rare Wildlife** as indicated on the most recent Estimated Habitat Map of State-Listed Rare Wetland Wildlife published by the Natural Heritage and Endangered Species Program (NHESP)? To view habitat maps, see the *Massachusetts Natural Heritage Atlas* or go to http://maps.massgis.state.ma.us/PRI_EST_HAB/viewer.htm.

- a. ☐ Yes ☒ No **If yes, include proof of mailing or hand delivery of NOI to:**

Natural Heritage and Endangered Species Program
Division of Fisheries and Wildlife
1 Rabbit Hill Road
Westborough, MA 01581

2020

b. Date of map

If yes, the project is also subject to Massachusetts Endangered Species Act (MESA) review (321 CMR 10.18). To qualify for a streamlined, 30-day, MESA/Wetlands Protection Act review, please complete Section C.1.c, and include requested materials with this Notice of Intent (NOI); *OR* complete Section C.2.f, if applicable. *If MESA supplemental information is not included with the NOI, by completing Section 1 of this form, the NHESP will require a separate MESA filing which may take up to 90 days to review (unless noted exceptions in Section 2 apply, see below).*

- c. Submit Supplemental Information for Endangered Species Review*

1. ☐ Percentage/acreage of property to be altered:

(a) within wetland Resource Area

percentage/acreage

(b) outside Resource Area

percentage/acreage

2. ☐ Assessor's Map or right-of-way plan of site

2. ☒ Project plans for entire project site, including wetland resource areas and areas outside of wetlands jurisdiction, showing existing and proposed conditions, existing and proposed tree/vegetation clearing line, and clearly demarcated limits of work **

(a) ☒ Project description (including description of impacts outside of wetland resource area & buffer zone)

(b) ☒ Photographs representative of the site

* Some projects **not** in Estimated Habitat may be located in Priority Habitat, and require NHESP review (see <http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/regulatory-review/>). Priority Habitat includes habitat for state-listed plants and strictly upland species not protected by the Wetlands Protection Act.

** MESA projects may not be segmented (321 CMR 10.16). The applicant must disclose full development plans even if such plans are not required as part of the Notice of Intent process.



Massachusetts Department of Environmental Protection
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WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

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Arlington

City/Town

C. Other Applicable Standards and Requirements (cont'd)

- (c) ☐ MESA filing fee (fee information available at http://www.mass.gov/dfwele/dfw/nhosp/regulatory_review/mesa/esa_fee_schedule.htm). Make check payable to "Commonwealth of Massachusetts - NHESP" and **mail to NHESP** at above address

Projects altering 10 or more acres of land, also submit:

- (d) ☐ Vegetation cover type map of site
- (e) ☐ Project plans showing Priority & Estimated Habitat boundaries
- (f) OR Check One of the Following

1. ☐ Project is exempt from MESA review.
Attach applicant letter indicating which MESA exemption applies. (See 321 CMR 10.14, http://www.mass.gov/dfwele/dfw/nhosp/regulatory_review/esa/esa_exemptions.htm; the NOI must still be sent to NHESP if the project is within estimated habitat pursuant to 310 CMR 10.37 and 10.59.)

2. ☐ Separate MESA review ongoing. a. NHESP Tracking # _____ b. Date submitted to NHESP _____

3. ☐ Separate MESA review completed.
Include copy of NHESP "no Take" determination or valid Conservation & Management Permit with approved plan.

3. For coastal projects only, is any portion of the proposed project located below the mean high water line or in a fish run?

- a. ☒ Not applicable – project is in inland resource area only b. ☐ Yes ☐ No

If yes, include proof of mailing, hand delivery, or electronic delivery of NOI to either:

South Shore - Cohasset to Rhode Island border, and the Cape & Islands:

Division of Marine Fisheries -
Southeast Marine Fisheries Station
Attn: Environmental Reviewer
836 South Rodney French Blvd.
New Bedford, MA 02744
Email: DMF.EnvReview-South@state.ma.us

North Shore - Hull to New Hampshire border:

Division of Marine Fisheries -
North Shore Office
Attn: Environmental Reviewer
30 Emerson Avenue
Gloucester, MA 01930
Email: DMF.EnvReview-North@state.ma.us

Also if yes, the project may require a Chapter 91 license. For coastal towns in the Northeast Region, please contact MassDEP's Boston Office. For coastal towns in the Southeast Region, please contact MassDEP's Southeast Regional Office.



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

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Arlington

City/Town

C. Other Applicable Standards and Requirements (cont'd)

Online Users:
Include your document transaction number (provided on your receipt page) with all supplementary information you submit to the Department.

4. Is any portion of the proposed project within an Area of Critical Environmental Concern (ACEC)?
a. ☐ Yes ☒ No If yes, provide name of ACEC (see instructions to WPA Form 3 or MassDEP Website for ACEC locations). **Note:** electronic filers click on Website.
b. ACEC
5. Is any portion of the proposed project within an area designated as an Outstanding Resource Water (ORW) as designated in the Massachusetts Surface Water Quality Standards, 314 CMR 4.00?
a. ☐ Yes ☒ No
6. Is any portion of the site subject to a Wetlands Restriction Order under the Inland Wetlands Restriction Act (M.G.L. c. 131, § 40A) or the Coastal Wetlands Restriction Act (M.G.L. c. 130, § 105)?
a. ☐ Yes ☒ No
7. Is this project subject to provisions of the MassDEP Stormwater Management Standards?
a. ☒ Yes. Attach a copy of the Stormwater Report as required by the Stormwater Management Standards per 310 CMR 10.05(6)(k)-(q) and check if:
1. ☐ Applying for Low Impact Development (LID) site design credits (as described in Stormwater Management Handbook Vol. 2, Chapter 3)
2. ☒ A portion of the site constitutes redevelopment
3. ☐ Proprietary BMPs are included in the Stormwater Management System.
b. ☐ No. Check why the project is exempt:
1. ☐ Single-family house
2. ☐ Emergency road repair
3. ☐ Small Residential Subdivision (less than or equal to 4 single-family houses or less than or equal to 4 units in multi-family housing project) with no discharge to Critical Areas.

D. Additional Information

- ☐ This is a proposal for an Ecological Restoration Limited Project. Skip Section D and complete Appendix A: Ecological Restoration Notice of Intent – Minimum Required Documents (310 CMR 10.12).

Applicants must include the following with this Notice of Intent (NOI). See instructions for details.

Online Users: Attach the document transaction number (provided on your receipt page) for any of the following information you submit to the Department.

1. ☒ USGS or other map of the area (along with a narrative description, if necessary) containing sufficient information for the Conservation Commission and the Department to locate the site. (Electronic filers may omit this item.)
2. ☒ Plans identifying the location of proposed activities (including activities proposed to serve as a Bordering Vegetated Wetland [BVW] replication area or other mitigating measure) relative to the boundaries of each affected resource area.



Massachusetts Department of Environmental Protection
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Provided by MassDEP:

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Arlington

City/Town

D. Additional Information (cont'd)

3. ☒ Identify the method for BVW and other resource area boundary delineations (MassDEP BVW Field Data Form(s), Determination of Applicability, Order of Resource Area Delineation, etc.), and attach documentation of the methodology.

4. ☒ List the titles and dates for all plans and other materials submitted with this NOI.

See appendix G Plans

a. Plan Title

b. Prepared By

c. Signed and Stamped by

d. Final Revision Date

e. Scale

f. Additional Plan or Document Title

g. Date

5. ☐ If there is more than one property owner, please attach a list of these property owners not listed on this form.
6. ☐ Attach proof of mailing for Natural Heritage and Endangered Species Program, if needed.
7. ☐ Attach proof of mailing for Massachusetts Division of Marine Fisheries, if needed.
8. ☐ Attach NOI Wetland Fee Transmittal Form
9. ☒ Attach Stormwater Report, if needed.

E. Fees

1. ☒ Fee Exempt: No filing fee shall be assessed for projects of any city, town, county, or district of the Commonwealth, federally recognized Indian tribe housing authority, municipal housing authority, or the Massachusetts Bay Transportation Authority.

Applicants must submit the following information (in addition to pages 1 and 2 of the NOI Wetland Fee Transmittal Form) to confirm fee payment:

2. Municipal Check Number

3. Check date

4. State Check Number

5. Check date

6. Payor name on check: First Name

7. Payor name on check: Last Name



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

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F. Signatures and Submittal Requirements

I hereby certify under the penalties of perjury that the foregoing Notice of Intent and accompanying plans, documents, and supporting data are true and complete to the best of my knowledge. I understand that the Conservation Commission will place notification of this Notice in a local newspaper at the expense of the applicant in accordance with the wetlands regulations, 310 CMR 10.05(5)(a).

I further certify under penalties of perjury that all abutters were notified of this application, pursuant to the requirements of M.G.L. c. 131, § 40. Notice must be made by Certificate of Mailing or in writing by hand delivery or certified mail (return receipt requested) to all abutters within 100 feet of the property line of the project location.

Emily Smith

1. Signature of Applicant

9/2/2020

2. Date

3. Signature of Property Owner (if different)

Andrew Keel

4. Date

9/2/2020

5. Signature of Representative (if any)

6. Date

For Conservation Commission:

Two copies of the completed Notice of Intent (Form 3), including supporting plans and documents, two copies of the NOI Wetland Fee Transmittal Form, and the city/town fee payment, to the Conservation Commission by certified mail or hand delivery.

For MassDEP:

One copy of the completed Notice of Intent (Form 3), including supporting plans and documents, one copy of the NOI Wetland Fee Transmittal Form, and a **copy** of the state fee payment to the MassDEP Regional Office (see Instructions) by certified mail or hand delivery.

Other:

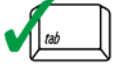
If the applicant has checked the "yes" box in any part of Section C, Item 3, above, refer to that section and the Instructions for additional submittal requirements.

The original and copies must be sent simultaneously. Failure by the applicant to send copies in a timely manner may result in dismissal of the Notice of Intent.



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands
NOI Wetland Fee Transmittal Form
Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A. Applicant Information

1. Location of Project:

a. Street Address

b. City/Town

c. Check number

d. Fee amount

2. Applicant Mailing Address:

a. First Name

b. Last Name

c. Organization

d. Mailing Address

e. City/Town

f. State

g. Zip Code

h. Phone Number

i. Fax Number

j. Email Address

3. Property Owner (if different):

a. First Name

b. Last Name

c. Organization

d. Mailing Address

e. City/Town

f. State

g. Zip Code

h. Phone Number

i. Fax Number

j. Email Address

To calculate filing fees, refer to the category fee list and examples in the instructions for filling out WPA Form 3 (Notice of Intent).

B. Fees

Fee should be calculated using the following process & worksheet. **Please see Instructions before filling out worksheet.**

Step 1/Type of Activity: Describe each type of activity that will occur in wetland resource area and buffer zone.

Step 2/Number of Activities: Identify the number of each type of activity.

Step 3/Individual Activity Fee: Identify each activity fee from the six project categories listed in the instructions.

Step 4/Subtotal Activity Fee: Multiply the number of activities (identified in Step 2) times the fee per category (identified in Step 3) to reach a subtotal fee amount. Note: If any of these activities are in a Riverfront Area in addition to another Resource Area or the Buffer Zone, the fee per activity should be multiplied by 1.5 and then added to the subtotal amount.

Step 5/Total Project Fee: Determine the total project fee by adding the subtotal amounts from Step 4.

Step 6/Fee Payments: To calculate the state share of the fee, divide the total fee in half and subtract \$12.50. To calculate the city/town share of the fee, divide the total fee in half and add \$12.50.



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NOI Wetland Fee Transmittal Form
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B. Fees (continued)

Step 1/Type of Activity	Step 2/Number of Activities	Step 3/Individual Activity Fee	Step 4/Subtotal Activity Fee

Step 5/Total Project Fee: _____

Step 6/Fee Payments:

Total Project Fee: _____
a. Total Fee from Step 5

State share of filing Fee: _____
b. 1/2 Total Fee **less** \$12.50

City/Town share of filing Fee: _____
c. 1/2 Total Fee **plus** \$12.50

C. Submittal Requirements

- a.) Complete pages 1 and 2 and send with a check or money order for the state share of the fee, payable to the Commonwealth of Massachusetts.

Department of Environmental Protection
Box 4062
Boston, MA 02211

- b.) **To the Conservation Commission:** Send the Notice of Intent or Abbreviated Notice of Intent; a **copy** of this form; and the city/town fee payment.

To MassDEP Regional Office (see Instructions): Send a copy of the Notice of Intent or Abbreviated Notice of Intent; a **copy** of this form; and a **copy** of the state fee payment. (E-filers of Notices of Intent may submit these electronically.)

Affidavit of Service

AFFIDAVIT OF SERVICE

I, Andrew Keel, being duly sworn, do hereby state as follows: on September 2, 2020, I mailed a "Notification to Abutters" in compliance with the second paragraph of Massachusetts General Laws, Chapter 131, s.40, the DEP Guide to Abutter Notification dated April 8, 1994, and the Arlington Wetlands Protection Bylaw, Title V, Article 8 of the Town of Arlington Bylaws in connection with the following matter:

Mill Brook Corridor & Wellington Park Revitalization – Phase 3

The form of the notification, and a list of the abutters to whom it was provided and their addresses, are attached to this Affidavit of Service.

Signed under the pains and penalties of perjury, this 2nd day of September 2020,



Andrew Keel, PLA
Project Manager, Landscape Architect
Hatch Associates Consultants, Inc.

Abutter Notification Form

Abutter Notification

Notification to Abutters Under the Massachusetts Wetlands Protection Act and Arlington Wetlands Protection Bylaw

In accordance with the second paragraph of Massachusetts General Laws Chapter 131, Section 40, and the Arlington Wetlands Protection Bylaw, you are hereby notified of the following:

The Conservation Commission will hold a public hearing in the second floor conference room of the Town Hall Annex, 730 Massachusetts Avenue, Arlington, on **17, September, 2020**, at **7:30pm** in accordance with the provisions of the Mass. Wetlands Protection Act (M.G.L. Ch. 131, s. 40, as amended) and the Town of Arlington Bylaws Article 8, Bylaw for Wetland Protection, for a Notice of Intent (or Request for Determination of Applicability) from **Emily Sullivan, for Mill Brook Corridor & Wellington Park Revitalization** at **0 Grove Street**, within **200 feet of a Riverfront OR a floodway**, on Assessor's Property Map/s # **54**, Lot/s # **54-1-1**.

A copy of the application and accompanying plans are available for inspection Mon. - Thurs. 8am-4pm and Fri. 8am-noon at the Conservation Commission office, first floor of the Town Hall Annex, 730 Massachusetts Avenue, Arlington, MA 02476. For more information call the applicant at **(781) 316-3012** or the Arlington Conservation Commission at 781-316-3012, or the DEP Northeast Regional Office at 978-694-3200.

NOTE: Notice of the Public Hearing will be published at least five (5) business days in advance in *The Arlington Advocate* and will also be posted at least 48 hours in advance in the Arlington Town Hall.

The meeting information for your hearing is:

Date: September 17, 2020

Time: 7:30pm

Certified List of Abutters



Office of the
Board of Assessors
Robbins Memorial Town Hall
Arlington, MA 02476
(781) 316-3050
Assessors@town.arlington.ma.us

Abutters List

Date: July 22, 2020

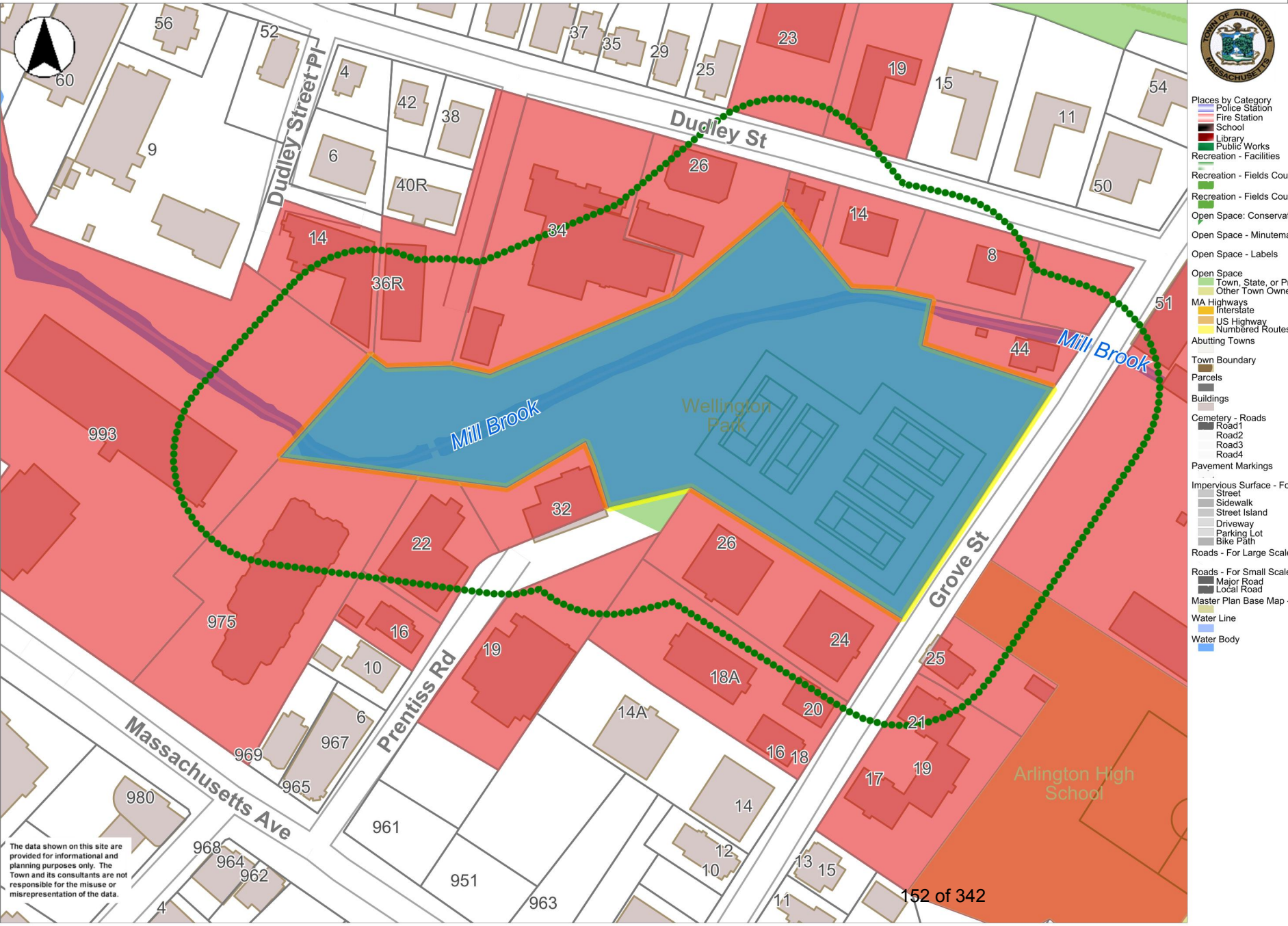
Subject Property Address: 0-LOT GROVE ST Arlington, MA
Wellington Park
Subject Property ID: 54-1-1

Search Distance: 100 Feet
Conservation

The Board of Assessors certifies the names and addresses of requested parties in interest, all abutters within 100 feet of the property lines, of subject property.

Kim C. Feeley
Robert E. Greeley
[Signature]

Board of Assessors



- Places by Category
- Police Station
 - Fire Station
 - School
 - Library
 - Public Works
 - Recreation - Facilities
 - Recreation - Fields Courts
 - Recreation - Fields Courts
 - Open Space - Conservation
 - Open Space - Minuteman
 - Open Space - Labels
 - Open Space
 - Town, State, or Private
 - Other Town Owned
 - MA Highways
 - Interstate
 - US Highway
 - Numbered Routes
 - Abutting Towns
 - Town Boundary
 - Parcels
 - Buildings
 - Cemetery - Roads
 - Road1
 - Road2
 - Road3
 - Road4
 - Pavement Markings
 - Impervious Surface - For B
 - Street
 - Sidewalk
 - Street Island
 - Driveway
 - Parking Lot
 - Bike Path
 - Roads - For Large Scale (f
 - Roads - For Small Scale (f
 - Major Road
 - Local Road
 - Master Plan Base Map - M
 - Water Line
 - Water Body

The data shown on this site are provided for informational and planning purposes only. The Town and its consultants are not responsible for the misuse or misrepresentation of the data.

Abutters List

Date: July 22, 2020

Subject Property Address: 0-LOT GROVE ST Arlington, MA
Wellington Park
Subject Property ID: 54-1-1

Search Distance: 100 Feet
Conservation

Prop ID: 54-1-19.A
Prop Location: 16-20 GROVE ST Arlington, MA
Owner: LOMBARD LEON E & SHIRLEY/TRS
Co-Owner: 20 GROVE STREET REALTY TRUST
Mailing Address:
20 GROVE ST
ARLINGTON, MA 02476

Prop ID: 54-1-21.A
Prop Location: 24-26 GROVE ST Arlington, MA
Owner: LOMBARD LEON E JR/TRUSTEE
Co-Owner: TARA-LEAH REALTY TR
Mailing Address:
20 GROVE ST
ARLINGTON, MA 02474

Prop ID: 54-1-24.A
Prop Location: 44 GROVE ST Arlington, MA
Owner: PRETZER XAVID
Co-Owner:
Mailing Address:
44 GROVE ST
ARLINGTON, MA 02476

Prop ID: 54-1-25.A
Prop Location: 0-LOT DUDLEY ST Arlington, MA
Owner: PRETZER XAVID
Co-Owner:
Mailing Address:
44 GROVE ST
ARLINGTON, MA 02476

Prop ID: 54-1-26
Prop Location: 8 DUDLEY ST Arlington, MA
Owner: ARLINGTON - DUDLEY REALTY LLC
Co-Owner:
Mailing Address:
59 UNION SQUARE
SOMERVILLE, MA 02143

Prop ID: 54-1-27
Prop Location: 14 DUDLEY ST Arlington, MA
Owner: ARLINGTON - DUDLEY REALTY LLC
Co-Owner:
Mailing Address:
59 UNION SQUARE
SOMERVILLE, MA 02143

Prop ID: 54-1-28
Prop Location: 0-LOT DUDLEY ST Arlington, MA
Owner: ARLINGTON - DUDLEY REALTY LLC
Co-Owner:
Mailing Address:
59 UNION SQUARE
SOMERVILLE, MA 02143

Prop ID: 54-2-6
Prop Location: 19 DUDLEY ST Arlington, MA
Owner: NOSTALGIA PROPERTIES LLC
Co-Owner:
Mailing Address:
39 BRIGHTON AVE
BOSTON, MA 02134

Prop ID: 54-3-2.A
Prop Location: 49 GROVE ST Arlington, MA
Owner: TOWN OF ARLINGTON TOWN YARD
Co-Owner: PUBLIC WORKS
Mailing Address:
730 MASS AVE
ARLINGTON, MA 02476

Prop ID: 54-3-2.B
Prop Location: 0-LOT GROVE ST Arlington, MA
Owner: TOWN OF ARLINGTON
Co-Owner: SCHOOL DEPT
Mailing Address:
27 MAPLE STREET
ARLINGTON, MA 02476

Prop ID: 54-3-3.A
Prop Location: 25 GROVE ST Arlington, MA
Owner: SUPPANISANUWONG PICHAI
Co-Owner:
Mailing Address:
25 GROVE ST
ARLINGTON, MA 02476

Prop ID: 54-3-4.A
Prop Location: 17-21 GROVE ST Arlington, MA
Owner: ARLINGTON-GROVE REALTY LLC
Co-Owner:
Mailing Address:
59 UNION SQ
SOMERVILLE, MA 02143

Prop ID: 54.A-1-3.1
Prop Location: 19 PRENTISS RD UNIT 1 Arlington, MA
Owner: ALOSIA REALTY TRUST 1349
Co-Owner: LEONE DAVID A ETAL TRS
Mailing Address:
19 PRENTISS RD UNIT 1
ARLINGTON, MA 02476

Prop ID: 54.A-1-3.2
Prop Location: 19 PRENTISS RD UNIT 2 Arlington, MA
Owner: SUNSHINE NURSERY SCHOOL INC.
Co-Owner:
Mailing Address:
19 PRENTISS RD UNIT 2
ARLINGTON, MA 02476

Prop ID: 55-1-14
Prop Location: 23 DUDLEY ST Arlington, MA
Owner: MALONEY SEAN P/TRUSTEE
Co-Owner: OXBOW REALTY TRUST
Mailing Address:
P. O. BOX 515
LEXINGTON, MA 02420

Prop ID: 55-2-1.A
Prop Location: 32 PRENTISS RD Arlington, MA
Owner: J & G PRENTISS LLC
Co-Owner:
Mailing Address:
32 PRENTISS RD
ARLINGTON, MA 02474

Prop ID: 55-2-3
Prop Location: 22 PRENTISS RD Arlington, MA
Owner: CARNEY JOHN A
Co-Owner:
Mailing Address:
98 RICHFIELD RD
ARLINGTON, MA 02474

Prop ID: 55-2-34
Prop Location: 14 DUDLEY CT Arlington, MA
Owner: 14 DUDLEY COURT LLC
Co-Owner:
Mailing Address:
6 EAST RD
SOUTH CHATHAM, MA 02659

Prop ID: 55-2-39.A
Prop Location: 36-R DUDLEY ST Arlington, MA
Owner: GREENE BRUCE
Co-Owner: JOHNSON LOUISE M
Mailing Address:
36R DUDLEY STREET
ARLINGTON, MA 02476

Prop ID: 55-2-39.B
Prop Location: 34 DUDLEY ST Arlington, MA
Owner: 34 DUDLEY STREET LLC
Co-Owner:
Mailing Address:
34 DUDLEY STREET
ARLINGTON, MA 02476

Prop ID: 55-2-41
Prop Location: 26 DUDLEY ST Arlington, MA
Owner: SANTINI MARK & GARY--TRS
Co-Owner: SANTINI REALTY TRUST
Mailing Address:
P.O. BOX 93
ARLINGTON, MA 02476

Prop ID: 55-2-5
Prop Location: 16 PRENTISS RD Arlington, MA
Owner: DELONG SARA & STEFFAN N
Co-Owner:
Mailing Address:
16 PRENTISS RD
ARLINGTON, MA 02476

Prop ID: 55.B-1-101
Prop Location: 993 MASS AVE UNIT 101 Arlington, MA
Owner: BUCHANAN ELAINE M
Co-Owner:
Mailing Address:
76 BEECH ST UNIT 2
BELMONT, MA 02478

Prop ID: 55.B-1-102
Prop Location: 993 MASS AVE UNIT 102 Arlington, MA
Owner: LIN JANE E
Co-Owner: LEE KEN A
Mailing Address:
993 MASS AVENUE #102
ARLINGTON, MA 02476

Prop ID: 55.B-1-103
Prop Location: 993 MASS AVE UNIT 103 Arlington, MA
Owner: MC KINNON GARRETT
Co-Owner:
Mailing Address:
239 PLEASANT STREET
ARLINGTON, MA 02476

Prop ID: 55.B-1-104
Prop Location: 993 MASS AVE UNIT 104 Arlington, MA
Owner: FABIANO DIANE M
Co-Owner:
Mailing Address:
993 MASS AVE #104
ARLINGTON, MA 02474

Prop ID: 55.B-1-105
Prop Location: 993 MASS AVE UNIT 105 Arlington, MA
Owner: URBAN JULIE A
Co-Owner:
Mailing Address:
993 MASS AVE #105
ARLINGTON, MA 02476

Prop ID: 55.B-1-106
Prop Location: 993 MASS AVE UNIT 106 Arlington, MA
Owner: BOWES ROBERT E
Co-Owner:
Mailing Address:
1010 MASS AVE
ARLINGTON, MA 02476

Prop ID: 55.B-1-107
Prop Location: 993 MASS AVE UNIT 107 Arlington, MA
Owner: SHANNON VIRGINIA A LIFE ESTATE
Co-Owner:
Mailing Address:
993 MASS AVENUE #107
ARLINGTON, MA 02476

Prop ID: 55.B-1-108
Prop Location: 993 MASS AVE UNIT 108 Arlington, MA
Owner: HART ASHLEY
Co-Owner:
Mailing Address:
993 MASSACHUSETTS AVE
UNIT 108
ARLINGTON, MA 02476

Prop ID: 55.B-1-109
Prop Location: 993 MASS AVE UNIT 109 Arlington, MA
Owner: LENNEY CHRISTOPHER
Co-Owner:
Mailing Address:
993 MASS AVENUE #109
ARLINGTON, MA 02476

Prop ID: 55.B-1-110
Prop Location: 993 MASS AVE UNIT 110 Arlington, MA
Owner: REED MARY ELLEN
Co-Owner:
Mailing Address:
993 MASS AVE #110
ARLINGTON, MA 02476

Prop ID: 55.B-1-111
Prop Location: 993 MASS AVE UNIT 111 Arlington, MA
Owner: OSHEA EILEEN
Co-Owner:
Mailing Address:
993 MASS AVE #111
ARLINGTON, MA 02476

Prop ID: 55.B-1-112
Prop Location: 993 MASS AVE UNIT 112 Arlington, MA
Owner: NARDONE WILLIAM & JEAN M
Co-Owner:
Mailing Address:
993 MASS AVENUE #112
ARLINGTON, MA 02476

Prop ID: 55.B-1-113
Prop Location: 993 MASS AVE UNIT 113 Arlington, MA
Owner: SHEEHAN MEAGHAN
Co-Owner:
Mailing Address:
581 OLD STRAWBERRY HILL RD
CENTERVILLE MA, MA 02632

Prop ID: 55.B-1-114
Prop Location: 993 MASS AVE UNIT 114 Arlington, MA
Owner: IKEMOTO BRIAN Y
Co-Owner:
Mailing Address:
993 MASS AVENUE #114
ARLINGTON, MA 02476

Prop ID: 55.B-1-115
Prop Location: 993 MASS AVE UNIT 115 Arlington, MA
Owner: CLERMONT JACQUELYN M
Co-Owner:
Mailing Address:
993 MASSACHUSETTS AVE #115
ARLINGTON, MA 02476

Prop ID: 55.B-1-117
Prop Location: 993 MASS AVE UNIT 117 Arlington, MA
Owner: CHYI SHYUE-LING
Co-Owner:
Mailing Address:
993 MASS AVENUE #117
ARLINGTON, MA 02476

Prop ID: 55.B-1-118
Prop Location: 993 MASS AVE UNIT 118 Arlington, MA
Owner: CHAN YUKTONG & MARY
Co-Owner:
Mailing Address:
993 MASS AVENUE UNIT 118
ARLINGTON, MA 02476

Prop ID: 55.B-1-119
Prop Location: 993 MASS AVE UNIT 119 Arlington, MA
Owner: KUNSMAN JANET M
Co-Owner:
Mailing Address:
134 WOODSIDE LANE
ARLINGTON, MA 02474

Prop ID: 55.B-1-120
Prop Location: 993 MASS AVE UNIT 120 Arlington, MA
Owner: BAGHDADI REZA
Co-Owner: SOLOUKI SAEIDEH
Mailing Address:
993 MASS AVE UNIT 120
ARLINGTON, MA 02476

Prop ID: 55.B-1-121
Prop Location: 993 MASS AVE UNIT 121 Arlington, MA
Owner: PANTAZOPOULOS NICHOLAS
Co-Owner:
Mailing Address:
993 MASS AVE #121
ARLINGTON, MA 02476

Prop ID: 55.B-1-122
Prop Location: 993 MASS AVE UNIT 122 Arlington, MA
Owner: LIVINGSTONE DAVID J
Co-Owner:
Mailing Address:
993 MASS AVENUE #122
ARLINGTON, MA 02476

Prop ID: 55.B-1-123
Prop Location: 993 MASS AVE UNIT 123 Arlington, MA
Owner: ARLINGTON HOUSING AUTHORITY
Co-Owner:
Mailing Address:
4 WINSLOW ST
ARLINGTON, MA 02476

Prop ID: 55.B-1-124
Prop Location: 993 MASS AVE UNIT 124 Arlington, MA
Owner: WILEY JUSTIN
Co-Owner:
Mailing Address:
993 MASS AVE #124
ARLINGTON, MA 02476

Prop ID: 55.B-1-125
Prop Location: 993 MASS AVE UNIT 125 Arlington, MA
Owner: CLABAUGH JERRY A
Co-Owner:
Mailing Address:
993 MASS AVENUE #125
ARLINGTON, MA 02476

Prop ID: 55.B-1-126
Prop Location: 993 MASS AVE UNIT 126 Arlington, MA
Owner: SOUZA PAUL A/TRUSTEE
Co-Owner: BLAIR MICHAEL WARD
Mailing Address:
204 OSCEOLA RD
BELLEAIR, FL 33770

Prop ID: 55.B-1-127
Prop Location: 993 MASS AVE UNIT 127 Arlington, MA
Owner: PASQUALE FRANCO
Co-Owner:
Mailing Address:
993 MASS AVE #127
ARLINGTON, MA 02474

Prop ID: 55.B-1-128
Prop Location: 993 MASS AVE UNIT 128 Arlington, MA
Owner: LAM VINCENT
Co-Owner: ZHAO YAN
Mailing Address:
993 MASS AVE UNIT 128
ARLINGTON, MA 02476

Prop ID: 55.B-1-201
Prop Location: 993 MASS AVE UNIT 201 Arlington, MA
Owner: BAGHDADI REZA
Co-Owner: SOLOUKI SAEIDEH
Mailing Address:
993 MASS AVE #201
ARLINGTON, MA 02476

Prop ID: 55.B-1-202
Prop Location: 993 MASS AVE UNIT 202 Arlington, MA
Owner: PARATORE JOSEPHINE
Co-Owner:
Mailing Address:
28 CROSS STREET
BELMONT, MA 02478

Prop ID: 55.B-1-203
Prop Location: 993 MASS AVE UNIT 203 Arlington, MA
Owner: DANALEVICH JENNIFER
Co-Owner:
Mailing Address:
1 CONN ST #3
WOBURN, MA 01801

Prop ID: 55.B-1-204
Prop Location: 993 MASS AVE UNIT 204 Arlington, MA
Owner: ILIC KATARINA
Co-Owner:
Mailing Address:
993 MASS AVE UNIT 204
ARLINGTON, MA 02476

Prop ID: 55.B-1-205
Prop Location: 993 MASS AVE UNIT 205 Arlington, MA
Owner: PHIPPS HEATHER M
Co-Owner:
Mailing Address:
993 MASS AVE #205
ARLINGTON, MA 02474

Prop ID: 55.B-1-206
Prop Location: 993 MASS AVE UNIT 206 Arlington, MA
Owner: KAHN ELIZABETH/ TRUSTEE
Co-Owner: BURKE REALTY TRUST
Mailing Address:
2424 EUCLID ST
SANTA MONICA, CA 90405

Prop ID: 55.B-1-207
Prop Location: 993 MASS AVE UNIT 207 Arlington, MA
Owner: ILIC KATARINA
Co-Owner:
Mailing Address:
993 MASS AVE UNIT 204
ARLINGTON, MA 02476

Prop ID: 55.B-1-208
Prop Location: 993 MASS AVE UNIT 208 Arlington, MA
Owner: FLANIGAN ELAINE & JAMES
Co-Owner: TRS/JAMES FLANNIGAN TRUST
Mailing Address:
190 BARLEY NECK ROAD
ORLEANS, MA 02653

Prop ID: 55.B-1-209
Prop Location: 993 MASS AVE UNIT 209 Arlington, MA
Owner: HORAN MATTHEW R
Co-Owner:
Mailing Address:
993 MASS AVE UNIT 209
ARLINGTON, MA 02474

Prop ID: 55.B-1-210
Prop Location: 993 MASS AVE UNIT 210 Arlington, MA
Owner: DALLAS ANN F
Co-Owner:
Mailing Address:
993 MASS AVE #210
ARLINGTON, MA 02476

Prop ID: 55.B-1-211
Prop Location: 993 MASS AVE UNIT 211 Arlington, MA
Owner: DILEO RUTSTEIN HEIDI
Co-Owner: DILEO DENNIS
Mailing Address:
14 LOCKE STREET
WINCHESTER, MA 01890

Prop ID: 55.B-1-212
Prop Location: 993 MASS AVE UNIT 212 Arlington, MA
Owner: O'BRIEN MICHAEL
Co-Owner: SHEN QIANRU
Mailing Address:
993 MASS AVE UNIT 212
ARLINGTON, MA 02476

Prop ID: 55.B-1-213
Prop Location: 993 MASS AVE UNIT 213 Arlington, MA
Owner: CHEN QIAN
Co-Owner:
Mailing Address:
993 MASS AVENUE #213
ARLINGTON, MA 02476

Prop ID: 55.B-1-214
Prop Location: 993 MASS AVE UNIT 214 Arlington, MA
Owner: YOUNG WILLIAM F/TRUSTEE
Co-Owner: WILLIAM YOUNG JR TRUST
Mailing Address:
PO BOX 327 DEPT 16
HOUSTON, TX 77001

Prop ID: 55.B-1-215
Prop Location: 993 MASS AVE UNIT 215 Arlington, MA
Owner: KARAASLANIAN JACQUELINE
Co-Owner:
Mailing Address:
993 MASS AVE UNIT 215
ARLINGTON, MA 02476

Prop ID: 55.B-1-216
Prop Location: 993 MASS AVE UNIT 216 Arlington, MA
Owner: PAUL DAVID S
Co-Owner:
Mailing Address:
993 MASS AVE #216
ARLINGTON, MA 02476

Prop ID: 55.B-1-217
Prop Location: 993 MASS AVE UNIT 217 Arlington, MA
Owner: HEALEY MARGARET L
Co-Owner:
Mailing Address:
993 MASS AVE
ARLINGTON, MA 02476

Prop ID: 55.B-1-218
Prop Location: 993 MASS AVE UNIT 218 Arlington, MA
Owner: PINE DANIEL R
Co-Owner:
Mailing Address:
51 STOWECROFT ROAD
ARLINGTON, MA 02476

Prop ID: 55.B-1-219
Prop Location: 993 MASS AVE UNIT 219 Arlington, MA
Owner: RASOGIANNI PANAGIOTA
Co-Owner:
Mailing Address:
993 MASS AVENUE #219
ARLINGTON, MA 02476

Prop ID: 55.B-1-220
Prop Location: 993 MASS AVE UNIT 220 Arlington, MA
Owner: BOWLER ELIZABETH M
Co-Owner:
Mailing Address:
993 MASS AVENUE #220
ARLINGTON, MA 02476

Prop ID: 55.B-1-221
Prop Location: 993 MASS AVE UNIT 221 Arlington, MA
Owner: GUTHRIE LINDA
Co-Owner:
Mailing Address:
993 MASS AVE #221
ARLINGTON, MA 02476

Prop ID: 55.B-1-222
Prop Location: 993 MASS AVE UNIT 222 Arlington, MA
Owner: FREDERICK THOMAS & MARIA
Co-Owner:
Mailing Address:
167 SEVEN STAR ROAD
GROVELAND, MA 01834

Prop ID: 55.B-1-223
Prop Location: 993 MASS AVE UNIT 223 Arlington, MA
Owner: SIRACUSA JAMES M JR
Co-Owner:
Mailing Address:
993 MASS AVE UNIT 223
ARLINGTON, MA 02476

Prop ID: 55.B-1-224
Prop Location: 993 MASS AVE UNIT 224 Arlington, MA
Owner: GOULD MARGARET M--ETAL
Co-Owner: GOULD PATRICK A
Mailing Address:
91-1511 KAIKOHOLA ST
EWA BEACH, HI 96706

Prop ID: 55.B-1-225
Prop Location: 993 MASS AVE UNIT 225 Arlington, MA
Owner: BURKE SARA
Co-Owner:
Mailing Address:
993 MASS AVE #225
ARLINGTON, MA 02476

Prop ID: 55.B-1-226
Prop Location: 993 MASS AVE UNIT 226 Arlington, MA
Owner: ORIA MYRA
Co-Owner:
Mailing Address:
993 MASS AVE #226
ARLINGTON, MA 02476

Prop ID: 55.B-1-227
Prop Location: 993 MASS AVE UNIT 227 Arlington, MA
Owner: ZHOU CHANGHAO
Co-Owner:
Mailing Address:
993 MASSACHUSETTS AVE #227
ARLINGTON, MA 02476

Prop ID: 55.B-1-228
Prop Location: 993 MASS AVE UNIT 228 Arlington, MA
Owner: MARTIN ROBERT J & KATHRYN S
Co-Owner:
Mailing Address:
993 MASS AVE UNIT 228
ARLINGTON, MA 02476

Prop ID: 55.B-1-301
Prop Location: 993 MASS AVE UNIT 301 Arlington, MA
Owner: MATTESON MARY BLISS
Co-Owner:
Mailing Address:
993 MASS AVE #301
ARLINGTON, MA 02476

Prop ID: 55.B-1-302
Prop Location: 993 MASS AVE UNIT 302 Arlington, MA
Owner: ZHU HUOHUI
Co-Owner: JI YANMIN
Mailing Address:
20 HAWTHORNE AVENUE
ARLINGTON, MA 02476

Prop ID: 55.B-1-303
Prop Location: 993 MASS AVE UNIT 303 Arlington, MA
Owner: NAJAFABADI MALIHE AHMADI
Co-Owner:
Mailing Address:
993 MASS AVE UNIT 303
ARLINGTON, MA 02476

Prop ID: 55.B-1-304
Prop Location: 993 MASS AVE UNIT 304 Arlington, MA
Owner: MICKEVICH ANNA
Co-Owner:
Mailing Address:
993 MASS AVE #304
ARLINGTON, MA 02476

Prop ID: 55.B-1-305
Prop Location: 993 MASS AVE UNIT 305 Arlington, MA
Owner: BHATTACHAN JONU &
Co-Owner: TULACHAN ANUP
Mailing Address:
993 MASS AVE UNIT 305
ARLINGTON, MA 02474

Prop ID: 55.B-1-306
Prop Location: 993 MASS AVE UNIT 306 Arlington, MA
Owner: HARVEY THOMAS M
Co-Owner:
Mailing Address:
993 MASS AVE UNIT 306
ARLINGTON, MA 02476

Prop ID: 55.B-1-307
Prop Location: 993 MASS AVE UNIT 307 Arlington, MA
Owner: AGHDAMLIAN LUCIE A
Co-Owner: AGHDAMLIAN ANTRANIK S
Mailing Address:
993 MASS AVENUE #307
ARLINGTON, MA 02476

Prop ID: 55.B-1-308
Prop Location: 993 MASS AVE UNIT 308 Arlington, MA
Owner: CHEAH JENYENG & SUSAN &
Co-Owner: LIANG WENKWAY
Mailing Address:
993 MASS AVENUE #308
ARLINGTON, MA 02476

Prop ID: 55.B-1-309
Prop Location: 993 MASS AVE UNIT 309 Arlington, MA
Owner: WECHSLER MARJORIE
Co-Owner:
Mailing Address:
993 MASS AVE #309
ARLINGTON, MA 02476

Prop ID: 55.B-1-310
Prop Location: 993 MASS AVE UNIT 310 Arlington, MA
Owner: SHEN GRACE
Co-Owner:
Mailing Address:
993 MASS AVE #320
ARLINGTON, MA 02476

Prop ID: 55.B-1-311
Prop Location: 993 MASS AVE UNIT 311 Arlington, MA
Owner: HAMWEY BARBARA
Co-Owner:
Mailing Address:
993 MASS AVENUE #311
ARLINGTON, MA 02476

Prop ID: 55.B-1-312
Prop Location: 993 MASS AVE UNIT 312 Arlington, MA
Owner: CHAVES ANTONIO F-MARIA M
Co-Owner:
Mailing Address:
434 APPLETON STREET
ARLINGTON, MA 02476

Prop ID: 55.B-1-313
Prop Location: 993 MASS AVE UNIT 313 Arlington, MA
Owner: GARCIA FRANCISCO--ETAL
Co-Owner: GARCIA CORALIA M
Mailing Address:
5 COPPERSMITH WAY
LEXINGTON, MA 02476

Prop ID: 55.B-1-314
Prop Location: 993 MASS AVE UNIT 314 Arlington, MA
Owner: GUAN CHENGHE
Co-Owner: ZHANG JING
Mailing Address:
993 MASS AVE #314
ARLINGTON, MA 02476

Prop ID: 55.B-2-101
Prop Location: 995 MASS AVE UNIT 101 Arlington, MA
Owner: BARNES ANGELA/ETAL
Co-Owner: FITTANTE MICHAEL
Mailing Address:
2 BAKER ST
HONOLULU, HI 96818

Prop ID: 55.B-2-102
Prop Location: 995 MASS AVE UNIT 102 Arlington, MA
Owner: DEFEO MATTHEW
Co-Owner:
Mailing Address:
995 MASS AVE
UNIT # 102
ARLINGTON, MA 02476

Prop ID: 55.B-2-103
Prop Location: 995 MASS AVE UNIT 103 Arlington, MA
Owner: TEEHAN EDWARD R JR &
Co-Owner: TEEHAN MARGARET M
Mailing Address:
995 MASS AVENUE #103
ARLINGTON, MA 02476

Prop ID: 55.B-2-104
Prop Location: 995 MASS AVE UNIT 104 Arlington, MA
Owner: CORRICELLI DAVID
Co-Owner:
Mailing Address:
995 MASS AVENUE #104
ARLINGTON, MA 02476

Prop ID: 55.B-2-105
Prop Location: 995 MASS AVE UNIT 105 Arlington, MA
Owner: PASQUALE FRANCO
Co-Owner:
Mailing Address:
995 MASS AVE UNIT 105
ARLINGTON, MA 02476

Prop ID: 55.B-2-106
Prop Location: 995 MASS AVE UNIT 106 Arlington, MA
Owner: LERNER DEVON A
Co-Owner:
Mailing Address:
48 FLORENCE AVENUE
UNIT 2
ARLINGTON, MA 02476

Prop ID: 55.B-2-201
Prop Location: 995 MASS AVE UNIT 201 Arlington, MA
Owner: ZAVARO GEORGE
Co-Owner: ZAVARO NAHREIN
Mailing Address:
60 BRIGHTON ST
BELMONT, MA 02478

Prop ID: 55.B-2-202
Prop Location: 995 MASS AVE UNIT 202 Arlington, MA
Owner: GARRITY ANNE M--TRUSTEE
Co-Owner: D & G REALTY TRUST
Mailing Address:
995 MASS AVENUE #202
ARLINGTON, MA 02476

Prop ID: 55.B-2-203
Prop Location: 995 MASS AVE UNIT 203 Arlington, MA
Owner: CHIVUKULA SRINIVAS & SUSMITHA
Co-Owner:
Mailing Address:
8 HERON CIR UNIT 8
WALPOLE, MA 02081

Prop ID: 55.B-2-204
Prop Location: 995 MASS AVE UNIT 204 Arlington, MA
Owner: MACDONALD SHARON
Co-Owner:
Mailing Address:
995 MASS AVENUE #204
ARLINGTON, MA 02476

Prop ID: 55.B-2-205
Prop Location: 995 MASS AVE UNIT 205 Arlington, MA
Owner: CICCOLO MICHAEL
Co-Owner: GALLAGHER JASON E
Mailing Address:
54 SAINT MARKS RD
DORCHESTER, MA 02124

Prop ID: 55.B-2-206
Prop Location: 995 MASS AVE UNIT 206 Arlington, MA
Owner: LAN TAO/CHEN KEXI
Co-Owner:
Mailing Address:
8 ALBAMONT ROAD
WINCHESTER, MA 01890

Prop ID: 55.B-2-301
Prop Location: 995 MASS AVE UNIT 301 Arlington, MA
Owner: SU CLEMENT C
Co-Owner: WONG WENDY R
Mailing Address:
995 MASS AVE #301
ARLINGTON, MA 02476

Prop ID: 55.B-2-302
Prop Location: 995 MASS AVE UNIT 302 Arlington, MA
Owner: MCGOLDRICK ROBERTA J
Co-Owner:
Mailing Address:
995 MASS AVE #302
ARLINGTON, MA 02476

Prop ID: 55.B-2-303
Prop Location: 995 MASS AVE UNIT 303 Arlington, MA
Owner: TASHJIAN RONALD S/TRUSTEE
Co-Owner: TASHJIAN NOMINEE TRUST
Mailing Address:
37 BOULDER RIDGE
PLYMOUTH, MA 02360

Prop ID: 55.B-2-304
Prop Location: 995 MASS AVE UNIT 304 Arlington, MA
Owner: CLEVELAND THOMAS /TRUSTEE
Co-Owner: SANDRA CLEVELAND TRUST
Mailing Address:
EDINBURG CENTER/SANDRA CLEVELAND
205 BURLINGTON RD
BEDFORD, MA 01730

Prop ID: 55.B-2-305
Prop Location: 995 MASS AVE UNIT 305 Arlington, MA
Owner: BIRD CHRISTINE W
Co-Owner:
Mailing Address:
995 MASS AVE #305
ARLINGTON, MA 02476

Prop ID: 55.B-2-306
Prop Location: 995 MASS AVE UNIT 306 Arlington, MA
Owner: LEUNG YUK KWAI/ TRUSTEE
Co-Owner: YUK KWAI LEUNG TRUST UDT
Mailing Address:
801 FRANKLIN ST #715
OAKLAND, CA 94607

Prop ID: 55.B-2-401
Prop Location: 995 MASS AVE UNIT 401 Arlington, MA
Owner: BLOOMQUIST ALAN
Co-Owner:
Mailing Address:
88 APPLETON STREET
QUINCY, MA 02171

Prop ID: 55.B-2-402
Prop Location: 995 MASS AVE UNIT 402 Arlington, MA
Owner: KREIFELDT ALEXANDER G
Co-Owner:
Mailing Address:
995 MASS AVE #402
ARLINGTON, MA 02476

Prop ID: 55.B-2-403
Prop Location: 995 MASS AVE UNIT 403 Arlington, MA
Owner: BARRETT JOHN A
Co-Owner:
Mailing Address:
995 MASS AVENUE #403
ARLINGTON, MA 02476

Prop ID: 55.B-2-404
Prop Location: 995 MASS AVE UNIT 404 Arlington, MA
Owner: SHINE GAETANA/MICHAEL
Co-Owner:
Mailing Address:
995 MASS AVE #404
ARLINGTON, MA 02476

Prop ID: 55.B-2-405
Prop Location: 995 MASS AVE UNIT 405 Arlington, MA
Owner: QUI GEPING
Co-Owner:
Mailing Address:
6 NASSAU DR
WINCHESTER, MA 01890

Prop ID: 55.B-2-406
Prop Location: 995 MASS AVE UNIT 406 Arlington, MA
Owner: BOYCE SUZANNE E
Co-Owner:
Mailing Address:
2700 ASHLAND AVE UNIT 21
CINCINNATI, OH 45206

Prop ID: 55.B-2-501
Prop Location: 995 MASS AVE UNIT 501 Arlington, MA
Owner: GRUBEL JOANNA
Co-Owner:
Mailing Address:
995 MASS AVE UNIT 501
ARLINGTON, MA 02474

Prop ID: 55.B-2-502
Prop Location: 995 MASS AVE UNIT 502 Arlington, MA
Owner: WEISS JOHN E & EMILY S
Co-Owner:
Mailing Address:
995 MASS AVE UNIT 502
ARLINGTON, MA 02476

Prop ID: 55.B-2-503
Prop Location: 995 MASS AVE UNIT 503 Arlington, MA
Owner: ROPI ELAINE
Co-Owner:
Mailing Address:
995 MASS AVENUE #503
ARLINGTON, MA 02476

Prop ID: 55.B-2-504
Prop Location: 995 MASS AVE UNIT 504 Arlington, MA
Owner: CARLINO JANET
Co-Owner:
Mailing Address:
995 MASS AVENUE #504
ARLINGTON, MA 02476

Prop ID: 55.B-2-505
Prop Location: 995 MASS AVE UNIT 505 Arlington, MA
Owner: LIANG RUITING &
Co-Owner: QIAO JING
Mailing Address:
995 MASS AVE #505
ARLINGTON, MA 02476

Prop ID: 55.B-2-506
Prop Location: 995 MASS AVE UNIT 506 Arlington, MA
Owner: MASTROCOLA DAVID/TRUSTEE
Co-Owner: MARY KATHRYN MASTROCOLA 2016
Mailing Address:
995 MASS AVE UNIT #506
ARLINGTON, MA 02476

Prop ID: 55.C-1-101
Prop Location: 975 MASS AVE UNIT 101 Arlington, MA
Owner: DELANO ROBERT J/TRUSTEE
Co-Owner: ROBERT J DELANO 2012 REVOCABLE
Mailing Address:
975 MASS AVENUE #101
ARLINGTON, MA 02476

Prop ID: 55.C-1-102
Prop Location: 975 MASS AVE UNIT 102 Arlington, MA
Owner: LANDSKOV ERIK L & GEOFFREY
Co-Owner: LANDSKOV DAVID L
Mailing Address:
32 OLDHAM RD
ARLINGTON, MA 02474

Prop ID: 55.C-1-103
Prop Location: 975 MASS AVE UNIT 103 Arlington, MA
Owner: SRETER JULIA I & ESTHER E
Co-Owner: SRETER ALBERT J TRUSTEES
Mailing Address:
33 BEDFORD ST SUITE 4
LEXINGTON, MA 02420

Prop ID: 55.C-1-104
Prop Location: 975 MASS AVE UNIT 104 Arlington, MA
Owner: CHENG TING-WEN
Co-Owner:
Mailing Address:
975 MASS AVE APT 104
ARLINGTON, MA 02476

Prop ID: 55.C-1-105
Prop Location: 975 MASS AVE UNIT 105 Arlington, MA
Owner: KAWATE TOMOHIKO
Co-Owner:
Mailing Address:
975 MASS AVENUE #105
ARLINGTON, MA 02476

Prop ID: 55.C-1-106
Prop Location: 975 MASS AVE UNIT 106 Arlington, MA
Owner: TORPEY MARY L
Co-Owner:
Mailing Address:
975 MASS AVENUE #106
ARLINGTON, MA 02476

Prop ID: 55.C-1-107
Prop Location: 975 MASS AVE UNIT 107 Arlington, MA
Owner: STERN SALLY R
Co-Owner:
Mailing Address:
975 MASS AVENUE #107
ARLINGTON, MA 02476

Prop ID: 55.C-1-108
Prop Location: 975 MASS AVE UNIT 108 Arlington, MA
Owner: LIPTON SHARON R & AMITAI
Co-Owner:
Mailing Address:
975 MASS AVENUE #108
ARLINGTON, MA 02476

Prop ID: 55.C-1-109
Prop Location: 975 MASS AVE UNIT 109 Arlington, MA
Owner: GARSIDE PAUL/TRUSTEE
Co-Owner: L & S REALTY TRUST
Mailing Address:
2 VINE BROOK WAY
UNIT 109
WOBBURN, MA 01801

Prop ID: 55.C-1-201
Prop Location: 975 MASS AVE UNIT 201 Arlington, MA
Owner: JULIER WILLIAM/WALBURGA MABEY
Co-Owner:
Mailing Address:
975 MASSACHUSETTS AVE #201
ARLINGTON, MA 02476

Prop ID: 55.C-1-202
Prop Location: 975 MASS AVE UNIT 202 Arlington, MA
Owner: HODGDON LAWRENCE A JR/TRUSTEE
Co-Owner: HODGDON FAMILY TRUST
Mailing Address:
975 MASS AVENUE #202
ARLINGTON, MA 02476

Prop ID: 55.C-1-203
Prop Location: 975 MASS AVE UNIT 203 Arlington, MA
Owner: ODOHOE THOMAS A/CATHERINE
Co-Owner:
Mailing Address:
975 MASS AVE #203
ARLINGTON, MA 02474

Prop ID: 55.C-1-204
Prop Location: 975 MASS AVE UNIT 204 Arlington, MA
Owner: COOK CHARLES/TRUSTEE
Co-Owner: CHARLES C COOK TRUST
Mailing Address:
975 MASS AVENUE #204
ARLINGTON, MA 02476

Prop ID: 55.C-1-205
Prop Location: 975 MASS AVE UNIT 205 Arlington, MA
Owner: DAVIDOVITZ MICHAEL/MARA
Co-Owner:
Mailing Address:
975 MASS AVENUE #205
ARLINGTON, MA 02476

Prop ID: 55.C-1-206
Prop Location: 975 MASS AVE UNIT 206 Arlington, MA
Owner: SPRINGS CAROL C
Co-Owner:
Mailing Address:
975 MASS AVENUE #206
ARLINGTON, MA 02476

Prop ID: 55.C-1-207
Prop Location: 975 MASS AVE UNIT 207 Arlington, MA
Owner: DAVIDSON PATRICIA S
Co-Owner: LIFE ESTATE
Mailing Address:
975 MASS AVE UNIT 207
ARLINGTON, MA 02476

Prop ID: 55.C-1-208
Prop Location: 975 MASS AVE UNIT 208 Arlington, MA
Owner: ZMIJEWSKI DAVID T
Co-Owner:
Mailing Address:
975 MASS AVENUE #208
ARLINGTON, MA 02476

Prop ID: 55.C-1-209
Prop Location: 975 MASS AVE UNIT 209 Arlington, MA
Owner: WELCH CHERYL A/TRUSTEE
Co-Owner: CHERYL WELCH REVOCABLE LIVING
Mailing Address:
975 MASS AVE #209
ARLINGTON, MA 02476

Prop ID: 55.C-1-301
Prop Location: 975 MASS AVE UNIT 301 Arlington, MA
Owner: WANG LISI
Co-Owner:
Mailing Address:
85 FULLER TERR
WEST NEWTON, MA 02465

Prop ID: 55.C-1-302
Prop Location: 975 MASS AVE UNIT 302 Arlington, MA
Owner: MACMILLAN LYNMARIE
Co-Owner:
Mailing Address:
975 MASS AVE #302
ARLINGTON, MA 02476

Prop ID: 55.C-1-303
Prop Location: 975 MASS AVE UNIT 303 Arlington, MA
Owner: DISESSA LORRAINE
Co-Owner:
Mailing Address:
975 MASS AVE #303
ARLINGTON, MA 02476

Prop ID: 55.C-1-304
Prop Location: 975 MASS AVE UNIT 304 Arlington, MA
Owner: MANGANARO DIANE MARIE
Co-Owner:
Mailing Address:
8 BRATTLE LANE
ARLINGTON, MA 02476

Prop ID: 55.C-1-305
Prop Location: 975 MASS AVE UNIT 305 Arlington, MA
Owner: GOULD MURIEL B
Co-Owner:
Mailing Address:
975 MASS AVE UNIT 305
ARLINGTON, MA 02476

Prop ID: 55.C-1-306
Prop Location: 975 MASS AVE UNIT 306 Arlington, MA
Owner: KUIN JAMES
Co-Owner:
Mailing Address:
60 SPRING GROVE RD
ANDOVER, MA 01810

Prop ID: 55.C-1-307
Prop Location: 975 MASS AVE UNIT 307 Arlington, MA
Owner: CHAUDHURI MEERA/ TRUSTEE
Co-Owner: 975 MASS AVE UNIT 307 RLTY TR
Mailing Address:
2279 SEMINOLE RD #1
ATLANTIC BEACH, FL 32233

Prop ID: 55.C-1-308
Prop Location: 975 MASS AVE UNIT 308 Arlington, MA
Owner: MATSUI AKIRA
Co-Owner: MATSUI NAOMI
Mailing Address:
975 MASSACHUSETTS AVE
APT 308
ARLINGTON, MA 02476-4545

Prop ID: 55.C-1-309
Prop Location: 975 MASS AVE UNIT 309 Arlington, MA
Owner: FONTAINE KENNETH
Co-Owner:
Mailing Address:
975 MASS AVE UNIT 309
ARLINGTON, MA 02476

Prop ID: 55.C-1-401
Prop Location: 975 MASS AVE UNIT 401 Arlington, MA
Owner: GOLDSMITH KEVIN J/TR &
Co-Owner: GOLDSMITH DEBORAH E/TRUSTEE OF
Mailing Address:
975 MASS AVE #401
ARLINGTON, MA 02476

Prop ID: 55.C-1-402
Prop Location: 975 MASS AVE UNIT 402 Arlington, MA
Owner: BASU BIJAY/SANKARI
Co-Owner:
Mailing Address:
975 MASS AVENUE #402
ARLINGTON, MA 02476

Prop ID: 55.C-1-403
Prop Location: 975 MASS AVE UNIT 403 Arlington, MA
Owner: COHN STEPHEN N TRUSTEE
Co-Owner: FIRST RAYMOND FAMILY TRUST
Mailing Address:
23 CAMBRIDGE ST
WINCHESTER, MA 01890

Prop ID: 55.C-1-404
Prop Location: 975 MASS AVE UNIT 404 Arlington, MA
Owner: SCICCHITANO JUDITH M
Co-Owner:
Mailing Address:
975 MASS AVENUE #404
ARLINGTON, MA 02476

Prop ID: 55.C-1-405
Prop Location: 975 MASS AVE UNIT 405 Arlington, MA
Owner: LEE BARBARA Y T /TRUSTEE
Co-Owner: THE BARBARA Y T LEE 2006 TRUST
Mailing Address:
975 MASS AVENUE
UNIT 405
ARLINGTON, MA 02476

Prop ID: 55.C-1-406
Prop Location: 975 MASS AVE UNIT 406 Arlington, MA
Owner: MORAIS ANGELA S
Co-Owner:
Mailing Address:
975 MASS AVENUE #406
ARLINGTON, MA 02476

Prop ID: 55.C-1-407
Prop Location: 975 MASS AVE UNIT 407 Arlington, MA
Owner: MARTIN GWENDOLYN
Co-Owner:
Mailing Address:
975 MASS AVE UNIT 407
ARLINGTON, MA 02476

Prop ID: 55.C-1-408
Prop Location: 975 MASS AVE UNIT 408 Arlington, MA
Owner: DING XIAOJUAN
Co-Owner:
Mailing Address:
125 JOHNSON RD
WINCHESTER, MA 01890

Prop ID: 55.C-1-409
Prop Location: 975 MASS AVE UNIT 409 Arlington, MA
Owner: DIMINO MICHAEL /TRUSTEE
Co-Owner: MICHAEL H DIMINO TRUST
Mailing Address:
195 EDENFIELD AVE
WATERTOWN, MA 02472

Prop ID: 55.C-1-501
Prop Location: 975 MASS AVE UNIT 501 Arlington, MA
Owner: HOEFER ROBERT F/TRUSTEE
Co-Owner: ROBERT HOEFER FAMILY TRUST
Mailing Address:
975 MASS AVENUE #501
ARLINGTON, MA 02476

Prop ID: 55.C-1-502
Prop Location: 975 MASS AVE UNIT 502 Arlington, MA
Owner: ALI SULEIMAN
Co-Owner:
Mailing Address:
975 MASS AVE UNIT 502
ARLINGTON, MA 02476-4546

Prop ID: 55.C-1-503
Prop Location: 975 MASS AVE UNIT 503 Arlington, MA
Owner: FREDERICK JOHN B
Co-Owner:
Mailing Address:
975 MASS AVENUE #503
ARLINGTON, MA 02476

Prop ID: 55.C-1-504
Prop Location: 975 MASS AVE UNIT 504 Arlington, MA
Owner: BACHINI REGINA M
Co-Owner:
Mailing Address:
975 MASS AVENUE #504
ARLINGTON, MA 02476

Prop ID: 55.C-1-505
Prop Location: 975 MASS AVE UNIT 505 Arlington, MA
Owner: FOLEY JAMES & KATHLEEN/TRS
Co-Owner: JIM AND KATHY 2008 TRUST
Mailing Address:
975 MASS AVENUE #505
ARLINGTON, MA 02476

Prop ID: 55.C-1-506
Prop Location: 975 MASS AVE UNIT 506 Arlington, MA
Owner: DUNN JULIE B
Co-Owner:
Mailing Address:
975 MASS AVE #506
ARLINGTON, MA 02476

Prop ID: 55.C-1-507
Prop Location: 975 MASS AVE UNIT 507 Arlington, MA
Owner: YANG HONG
Co-Owner: CHEN XI
Mailing Address:
829 ALTAIRE WALK
PALO ALTO, CA 94303

Prop ID: 55.C-1-508
Prop Location: 975 MASS AVE UNIT 508 Arlington, MA
Owner: TOPAZ DONALD I
Co-Owner:
Mailing Address:
975 MASS AVENUE #508
ARLINGTON, MA 02476

Prop ID: 55.C-1-509
Prop Location: 975 MASS AVE UNIT 509 Arlington, MA
Owner: DICIACCIO FRANK N & NANCY
Co-Owner:
Mailing Address:
975 MASS AVE UNIT 509
ARLINGTON, MA 02476

Legal Notice of Charge Authorization

LEGAL NOTICE CHARGE AUTHORIZATION

DATE: 9/2/2020

TO: legals@wickedlocal.com

I hereby authorize Community Newspapers to bill me directly for the legal notice to be published in the Arlington Advocate newspaper on _____ for a public hearing with the Arlington Conservation Commission to review a project at the following location: Wellington Park

Thank you.

Signed:



Andrew Keel, PLA
Project Manager, Landscape Architect
Hatch Associates Consultants, Inc.

Send bill to:

Emily Sullivan
730 Massachusetts Avenue
Arlington, MA 02476
Phone: 781-316-3012
Esullivan@town.arlington.ma.us

Appendix A – Narrative

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1. Introduction

On behalf of the Applicant, the Town of Arlington, Hatch is filing the enclosed Notice of Intent (NOI) Application with the Arlington Conservation Commission and Massachusetts Department of Environmental Protection (MassDEP) for revitalization of the Mill Brook corridor and adjacent Wellington Park (Appendix A – Figure 1) Assessors Map 54, Parcel 1-1. The majority of proposed activities take place within the FEMA-defined regulatory floodway or within the floodplain. This is a Phase III of the subject project. Phase II NOI for Mill Brook Corridor and Wellington Park Revitalization Project was prepared by Weston & Sampson in January 2019 and approved in February 2019 (DEP File No. 091-035).

The focus of the project as proposed in this NOI involves:

- Removal of (3) existing trees varying in size (4" dbh. Mulberry, 10" dbh. Mulberry, 16" dbh. Norway Maple) and invasive vegetation
- Modifications to existing boardwalk platform and transition to new porous path
- Installation of 6' wide porous bituminous concrete pathway (2,355 square feet)
- Installation of picnic bench over a concrete pad
- Installation of Naturalistic Exploration Play Area (boulders and black locust logs)
- Construction of stormwater BMP - bioretention basin, forebay and vegetated swale
- Planting of approximately 14 new 1-2" caliper canopy trees
- Planning of approximately 206 new understory trees and shrubs
- Planting approximately 2,215 new herbaceous plants

Plans for the locations of these removals and improvements within the park can be found in Appendix G – Plans.

2. Background and Existing Conditions

Wellington Park is a 2.72-acre public recreational park located in central Arlington, MA adjacent to Arlington High School. The project site is bordered by Grove Street to the east, Mill Brook to the north and north-west, private and Town-owned properties to the south-west.

Mill Brook crosses the northern edge of the site and flows from west to east. The existing banks are generally armored with grouted riprap. Sections of grouted riprap are eroded along the normal waterline. The banks of the brook transition to a stone and masonry wall on the east side of the park as it approaches the culvert that passes under Grove Street. This stone and masonry wall is in fair condition. Recent upgrades to the brook as part of the Wellington Brook Phase 2 improvements project included creation of a flood storage area. This storage is approximately 4 ft. deep from the existing ground surface and the bottom of new flood storage. The eastern half of the flood storage area ranges from approximately 1 to 2 feet lower than the FEMA 100-year floodplain. The side slopes near the inlet of the flood storage area are reinforced with riprap, with natural stone weirs in the Mill Brook downstream of the inlet and outlet to channel flow into the flood storage area. The flood storage capacity during the FEMA 100-year event is approximately 70 cubic yards.

Existing structures in Wellington Park include brick columns at the park entrance on Grove Street, five tennis courts enclosed by fences, and a large climbing structure made up of wood poles, rope line, and supporting guywires. The site also includes a pedestrian footpath, which is informal in some places and made of compacted earth/stone dust in other areas. At the westernmost end of the site, there is an existing wooden footbridge that crosses Mill Brook towards Dudley street.

The proposed project seeks to improve the park site universal accessibility and connectivity of recreation paths, install recreation amenities like a picnic table, bottle filler, and exploration/seating area, improve water quality of stormwater runoff flowing through park lands and enhance park vegetation quality and habitat (including invasive species control).

3. Environmental Considerations

Impacted environmental resource areas include riverfront area, 100-year flood zone and the bank. Each of these impact areas are discussed in further detail, below.

An estimated 2,725 square feet of work will be within the 100-year flood zone. The proposed regrading occurs in the location of the naturalistic exploration area all between elevations 62 and 63. Two small earth mounds are proposed as part of the exploration area, one of which falls within the 100-year flood zone. This mound accounts for approximately 40 cubic feet of fill. The proposed grade within the natural log and boulder feature of the exploration area will be lowered approximately 12" for a cut quantity of approximately 600 cubic feet. These areas net out for a total cut quantity of 560 cubic feet.

Approximately 22,780 square feet of riverfront area is within the limit of work. This work will include bioretention basin, outfall vegetated swale, porous bituminous concrete paving and invasive removals. The creation of bioretention pond storage area requires a 1' high berm on one side. The fill created by this berm is mitigated by the excavated bioretention surface area. The permeable pavement path is proposed to be at grade, except by a small raise in grade where the grass swale passes under the path. The fill there is mitigated by the excavated swale, invasive species removal and pedestrian path. This area is previously developed riverfront area (maintained lawn area, with the exception of the Japanese knotweed). By removing invasive vegetation and planting native species the ecological value of the Brook will be improved and the riverfront area will become a more diverse habitat for local species.

Approximately 8 LF of bank disturbance will occur where the shallow vegetative swale meets the bank. This area is currently made up of placed riprap. The riprap in this area will be temporarily moved in order to grade the shallow swale depression and then replaced in kind at the same elevation and location.

The only change in pervious area is near the tennis court entry toward the main park entrance (within the 50ft and 100ft riverfront buffer), where 100 square feet of stone dust path and lawn will be converted into concrete pad for a picnic table, and 234 square feet of concrete which lines the bioretention forebay (within the 100ft and 200ft riverfront buffer). This impervious area is not any closer to Mill Brook than existing impervious area at the site.

4. Meeting Riverfront Standards for Redevelopment Projects

The riverfront area within the limits of this project was previously developed as a recreational park and most recently altered with the completion of the pervious Wellington Park and Mill Brook - Phase 2 project creation of flood storage area and extension of paths and boardwalk. All proposed work at this site is considered re-development work in riverfront area. Each standard for work within the riverfront for redevelopment projects (per 310 CMR 10.58 (5)) are provided below, followed by an explanation on how the project meets each standard.

- (a) *At a minimum, proposed work shall result in an improvement over existing conditions of the capacity of the riverfront area to protect the interests identified in M.G.L. c. 131 § 40.*

Proposed work includes a bioretention basin, vegetated swale as well as removal of invasive species. The biobasin, a water quality BMP, controls parts of the existing impervious areas currently draining to the brook within the project area and will reduce sediment loads and other pollutants, therefore improves quality of runoff entering the river. This project will result in an improvement over existing conditions of the capacity of the riverfront area to protect the interests identified in M.G.L. c. 131 § 40.

- (b) *Stormwater management is provided according to standards established by the Department.*

Per Appendix C of the Notice of Intent, this project will adhere to the stormwater standards established by the Department.

- (c) *Within 200 foot riverfront areas, proposed work shall not be located closer to the river than existing conditions or 100 feet, whichever is less, or not closer than existing conditions within 25 foot riverfront areas, except in accordance with 310 CMR 10.58(5)(f) or (g).*

The porous bituminous concrete footpath, boardwalk transition, exploration/play area, picnic table, bottle filler, biobasin and vegetated swale will all be within previously altered area (maintained lawn and man-made bank). Invasive species management work will be in accordance with 310 CMR 10.58(5)(f) as this area is a degraded riverfront area (invasive species dominated area which does not provide optimal riverfront area habitat.) The project will provide improved habitat with a variety of native species being planted at the site.

- (d) *Proposed work, including expansion of existing structures, shall be located outside the riverfront area or toward the riverfront area boundary and away from the river, except in accordance with 310 CMR 10.58(5)(f) or (g).*

Proposed work is within the 200 ft riverfront area, however the work will be in accordance with 310 CMR 10.58(5)(f) as much of the work (invasive species maintenance, biobasin and porous bituminous concrete paving) is within a degraded riverfront area (maintained lawn and invasive species dominated area, neither of which currently provide significant riverfront area habitat).

- (e) *The area of proposed work shall not exceed the amount of degraded area, provided that the proposed work may alter up to 10% if the degraded area is less than 10% of the riverfront area, except in accordance with 310 CMR 10.58(5)(f) or (g).*

The area of proposed work within the riverfront area is 22,780 sf. Total riverfront area on the parcel is 300,000 sf. Thus, this project will alter 7.6 percent of the site's riverfront area. The work will be in accordance with 310 CMR 10.58(5)(f) as much of the work (invasive species maintenance, biobasin, exploration area and porous bituminous concrete paving) is within a degraded riverfront area.

- (f) *When an applicant proposes restoration on-site of degraded riverfront area, alteration may be allowed notwithstanding the criteria of 310 CMR 10.58(5)(c), (d), and (e) at a ratio in square feet of at least 1:1 of restored area to area of alteration not conforming to the criteria. Areas immediately along the river shall be selected for restoration. Alteration not conforming to criteria shall begin at the riverfront area boundary. Restoration shall include:*
- 1. removal of all debris, but retaining any trees or other mature vegetation;*
 - 2. grading to a topography which reduces runoff and increases infiltration;*
 - 3. coverage by topsoil at a depth consistent with natural conditions at the site; and*
 - 4. seeding and planting with an erosion control seed mixture, followed by plantings of herbaceous and woody species appropriate to the site;*

Restoration efforts will include creation of a biobasin area with a shallow vegetated swale outfall which will allow additional infiltration of surface runoff before entering the Brook, topsoil will be installed over disturbed degraded areas, various native species will be planted to provide a more natural environment. Three trees are proposed to be removed based on proximity to the proposed pathway, overall health and species habitat value. As part of the project (14) new canopy trees are being proposed. With the proposed tree removals the surrounding grade can be regraded and lowered to reduce runoff and potential erosion toward the Brook and provide safe access for both the MWRA sewer easement and park users.

- (g) *When an applicant proposes mitigation either on-site or in the riverfront area within the same general area of the river basin, alteration may be allowed notwithstanding the criteria of 310 CMR 10.58(5)(c), (d), or (e) at a ratio in square feet of at least 2:1 of mitigation area to area of alteration not conforming to the criteria or an equivalent level of environmental protection where square footage is not a relevant measure. Alteration not conforming to the criteria shall begin at the riverfront area boundary. Mitigation may include off-site restoration of riverfront areas, conservation restrictions under M.G.L. c. 184, §§ 31 through 33 to preserve undisturbed riverfront areas that could be otherwise altered under 310 CMR 10.00, the purchase of development rights within the riverfront area, the restoration of bordering vegetated wetland, projects to remedy an existing adverse impact on the interests identified in M.G.L. c. 131, § 40 for which the applicant is not legally responsible, or similar activities undertaken voluntarily by the applicant which will support a determination by the issuing authority of no significant adverse impact. Preference shall be given to potential mitigation projects, if any, identified in a River Basin Plan approved by the Secretary of the Executive Office of Energy and Environmental Affairs.*

Not applicable.

- (h) *The issuing authority shall include a continuing condition in the Certificate of Compliance for projects under 310 CMR 10.58(5)(f) or (g) prohibiting further alteration within the restoration or mitigation area, except as may be required to maintain the area in its restored or mitigated condition. Prior to requesting the issuance of the Certificate of Compliance, the applicant shall demonstrate the restoration or mitigation has been successfully completed for at least two growing seasons.*

Per Arlington conservation commission requirements, the area will be monitored for three years to ensure success of planting areas.

5. Vegetation Removal and Replacement

Per Section 24 of the Arlington Regulations for Wetlands Protection (March 1, 2018), vegetation that is removed within the jurisdiction of the conservation commission must be replaced in-kind. The vegetation to be removed includes invasive species, and trees (3).

The proposal to remove three trees is based on proximity to the proposed pathway, overall tree health and species habitat value. As part of the project (14) new canopy trees are being proposed. Replacement of the above-mentioned vegetation (invasives and trees) will provide an opportunity to create a more diverse native habitat.

See appendix H – sheet L-7 plant schedule for full list of species. All of the proposed plant material is native to the area and most of the selected material is included in the Town of Arlington preferred plant list.

6. Climate Change Resiliency

Per Section 31 of the Arlington Regulations for Wetlands Protection (March 1, 2018), the Applicant shall consider the project's adaptation to potential climate change impacts by addressing the following:

- (1) *Describe project design considerations to limit storm and flood damage during extended periods of disruption and flooding as might be expected in extreme weather events. See Vegetative Wetlands Section 21, Land Subject to Flooding Section 23, and Adjacent Upland Resource Area Section 25, of these Regulations.*

Adherence to requirement #1: Currently, the park's existing lawn area - specifically the zone to the north of the tennis courts - stays wet following rain events. This area is low-lying and acts as a basin, receiving stormwater that flows from adjacent lawn areas of slightly higher elevation, as well as from flow coming down Prentiss Road. Surface water in this pocket has been observed to drain slowly, likely due to reasons including soil compaction. The prolonged wet condition negatively impacts use of the park by visitors. Two impacts in particular are: (1) the existing lawn areas are used as informal pedestrian paths across the park and, when wet, reduce pedestrian movement; and (2) the existing informal footpath to the bridge is composed

of compacted earth, and when wet park users tend to walk on the vegetated edges, further contributing to the expanded degradation of vegetation.

To address these impacts of storm events to visitors' use of the park, recent park improvements replaced existing stone dust walks with porous bituminous concrete providing a more stable walking surface and a slight raising of the walk grade. The current project proposed to expand the porous pathway network providing connectivity to pedestrian bridge and adjacent Prentiss Road, using the same materials and methods as the recent Wellington Phase 2 project. This will provide a pedestrian pathway that can be used sooner after storm events than the current condition permit and will protect the vegetation adjacent to the path. Currently compacted green areas on the west side of the park will receive loam soil and woodland or meadow native seed that is not intended for regular mowing (see appendix F for operations and maintenance). When established the meadow grasses will slow the runoff and promote infiltration. Proposed seed establishment fencing along the new porous footpaths will limit pedestrian traffic onto the newly graded areas.

The existing impervious surfaces within the park are the tennis courts; perimeter drains are at the edges of the courts, and the drains are connected to storage directly under them.

The tennis courts are outside of this project's limit of work. A small area with benches and receptacles is adjacent to two gated tennis court access points was paved recently as part of phase 2 with cast-in-place concrete surfacing for the following reasons: to provide an easy-to-maintain area; to offer a stable walking surface around the benches and receptacles; to reduce heat absorption; and to minimize settlement. Similarly, adjacent to this existing sitting area, this project proposes a picnic table over a concrete pad and small porous walkway extension leading to it. The amount of impervious surface being added is approximately 100sf.

The regrading and net removal of approximately 560 cubic feet of soil in the area of the naturalistic exploration area will provide new flood storage area within the 100-year flood zone.

This project's limit of work does not extend to the north bank of the Brook. Current Brook flooding is accommodated mostly by overflow over the north bank; it extends into a vegetated area where no formal pathways exist, thus limiting impacts to current park use.

(2) Describe project stormwater surface runoff, which may increase due to storm surges and extreme weather events, and how this will be managed / mitigated to prevent pollution (including nutrients from fertilizers, roadway runoff, etc.) from entering the resource area with consideration of eliminating impervious surfaces as feasible. See Stormwater Management Section 33 of these Regulations.

Adherence to requirement #2: Currently storm runoff from Prentiss Road enters the park at the north-east end of the roadway pavement. The area draining to this point is approximately 0.50 acre in size and is 95% impervious. This runoff brings sediments onto the park lawns and erodes lawn areas, and results in soggy conditions limiting use of recreational areas after rainfall. The proposed biobasin with a sediment forebay (234 sf of new impervious area), will collect the sediments and trash within the paved forebay and will direct runoff to the bioretention area. The bioretention area is designed to store and infiltrate the first flush runoff volume (0.5" of

rainfall over the contributing impervious areas) and safely convey the runoff from larger storm frequencies through the outfall weir into the outfall vegetated swale in a controlled fashion. This will limit the park areas currently being inundated by runoff.

- (3) *Describe project vegetation / planting plans and other measures to improve the resiliency of the wildlife habitat of the resource area to withstand potential temperature and rainfall changes (drought and excess) due to climate change. See Vegetation Removal and Replacement Section 24 of these Regulations.*

Adherence to requirement #3: The south bank is lined with a handful of existing deciduous trees and tree stumps offering wildlife habitat, shade, and temperature mitigation. Most of the existing trees and stumps are located along the edge of the Brook. A total of 8 new shade trees are proposed along with (6) white pine. The proposed trees will provide new canopy cover reducing the effects of heat island effect.

The pruning of (4) large existing trees is also proposed, (3) Norway Maples and (1) Mulberry. The pruning of the existing invasive trees to remain will limit the potential for spread and reduce competition with the newly planted native trees which will improve the park wildlife habitat and ecological value.

Clearing and grubbing will occur so that overgrown plant material is removed, and the growing condition is improved for the trees to remain. The woodland areas of the park do not currently have a significant understory layer. New understory trees and shrubs will be planted to provide a diverse habitat. The existing groundcover layer of the park is also in poor condition. Herbaceous groundcovers, along with native woodland and meadow seed mixes are proposed to reduce the amount of lawn and provide habitat value.

A great deal of invasive plant removal was completed as part of the previous Wellington Park – Phase 2 improvements. A few existing stands of knotweed have survived along with areas of bittersweet, and garlic mustard. The removal of this remaining invasive vegetation as part of this project will again improve wildlife habitat and ecological diversity.

All proposed plant material (canopy, understory and groundcover) is native and selected for its ability to provide habitat value, pest resistance, wind resistance, heat stress resistance and drought tolerance as well as improve the species diversity of Wellington Park and Mill Brook.

Appendix B – Figures

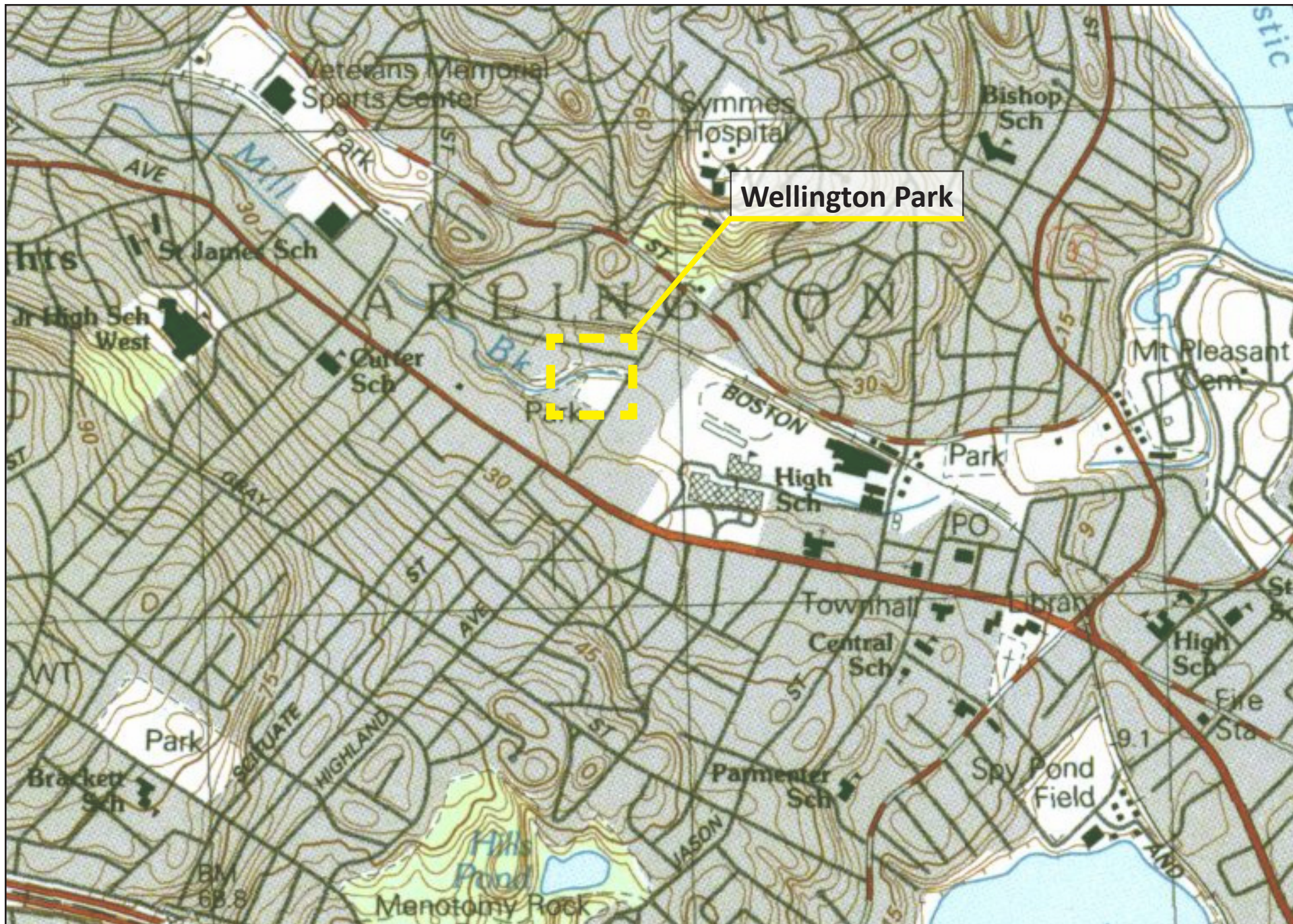
Figure 1: LOCUS MAP

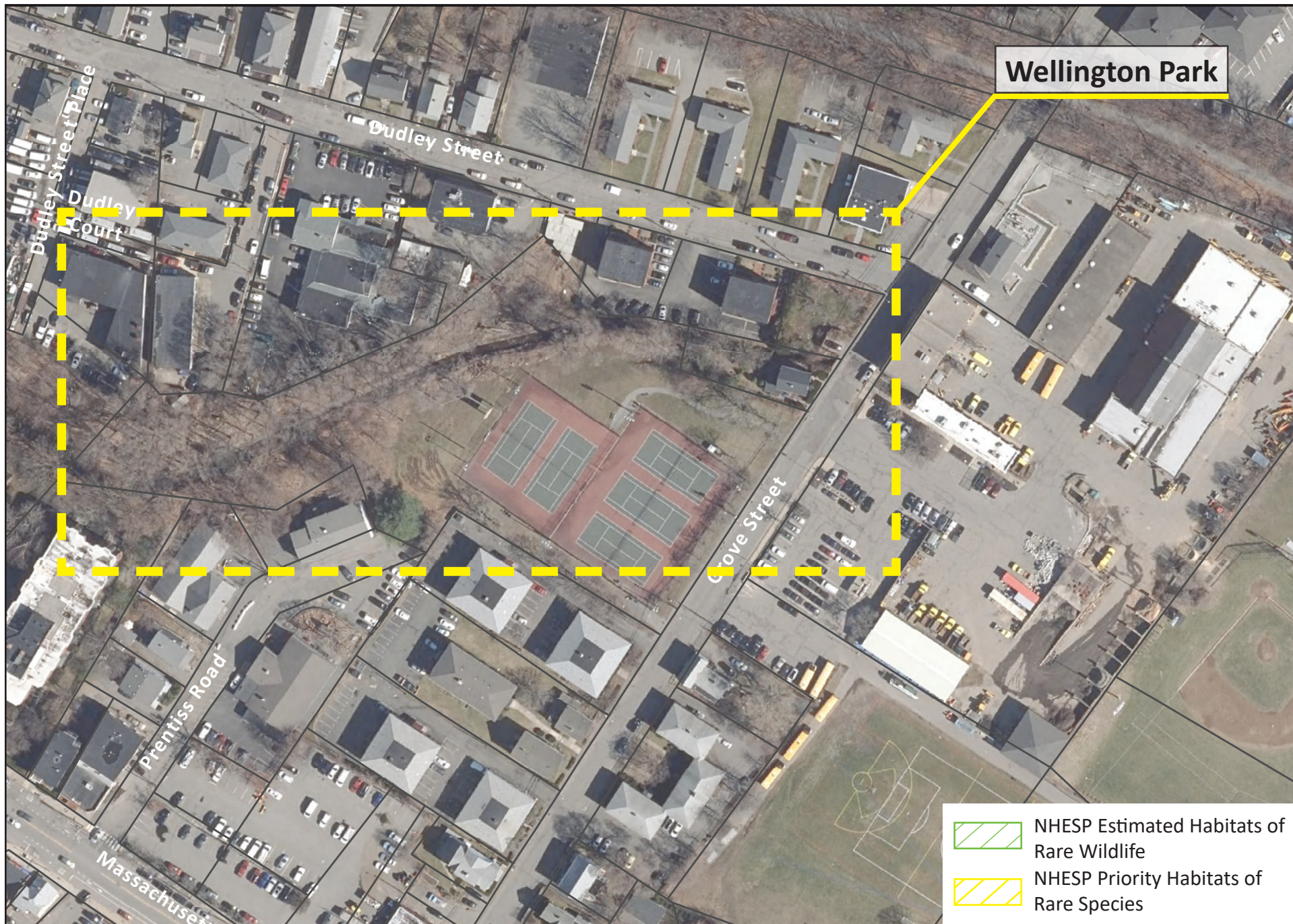
Figure 2: NATURAL HERITAGE AND ENDANGERED SPECIES PROGRAM MAP (NHESP)

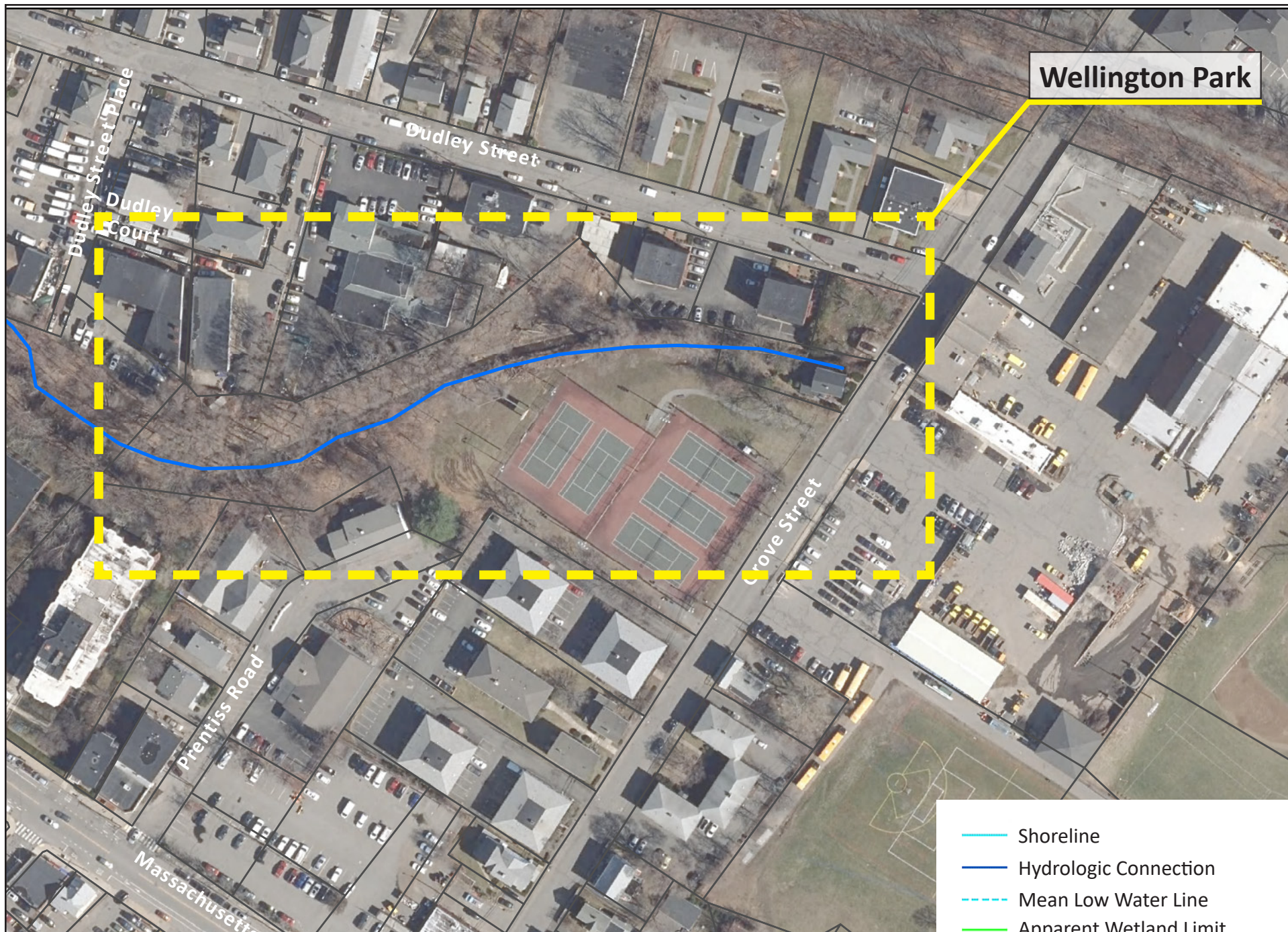
Figure 3: DEP WETLANDS MAP

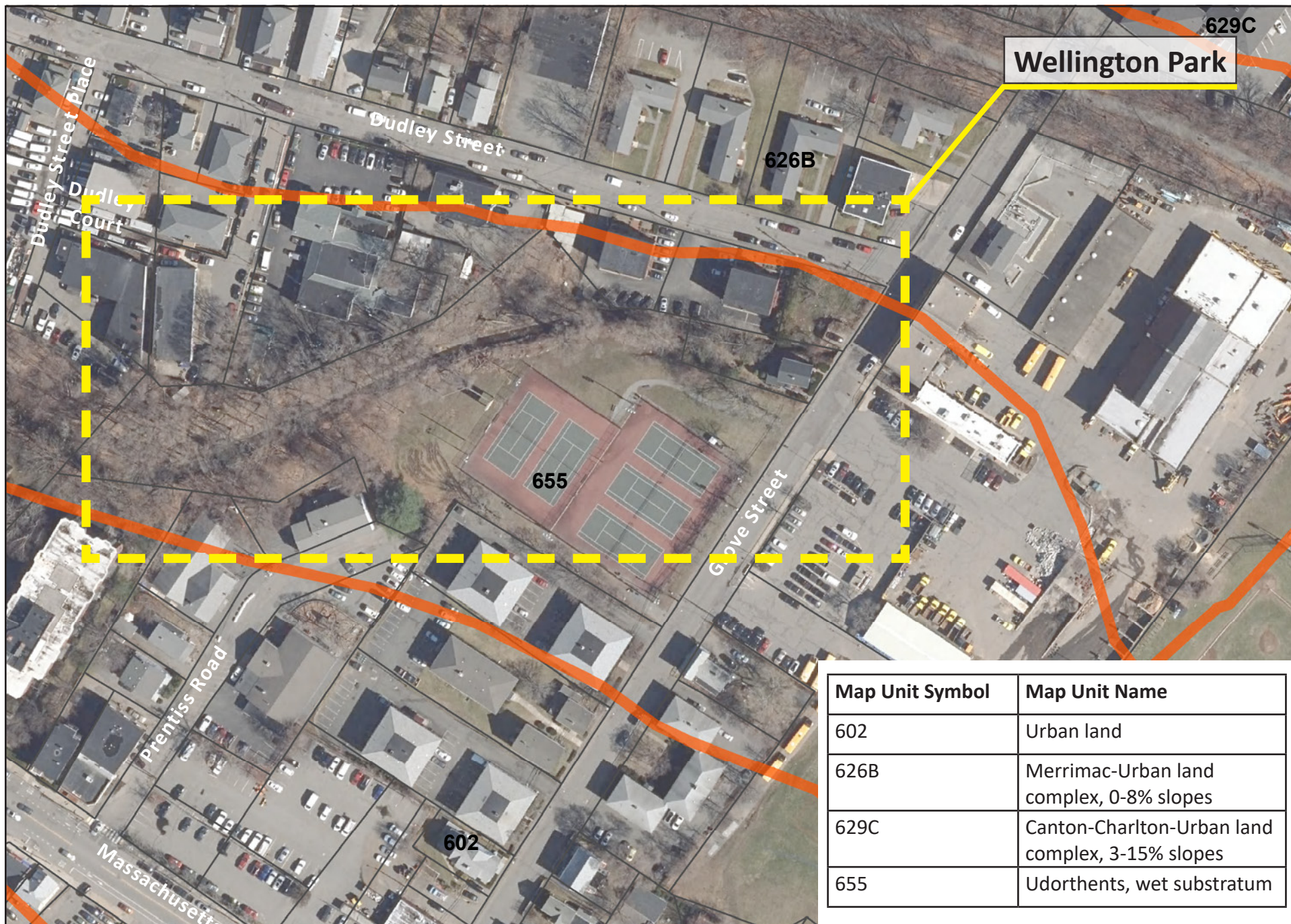
Figure 4: NRCS SOILS MAP

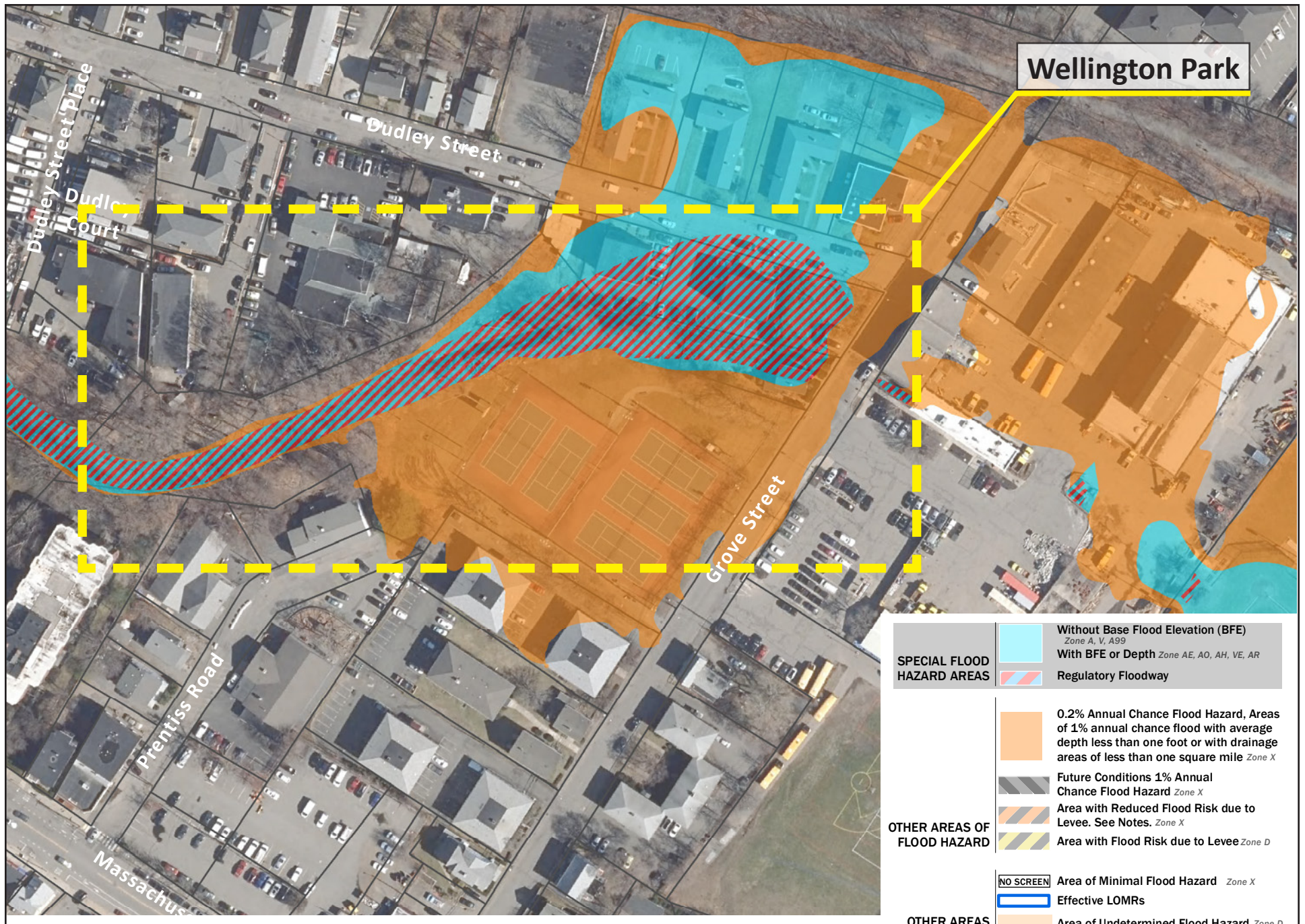
Figure 5: FEMA FIRM FLOODPLAIN MAP











Appendix C – Stormwater Report



Checklist for Stormwater Report

A. Introduction

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the [Massachusetts Stormwater Handbook](#). The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.¹ This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8²
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

¹ The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

² For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.



Checklist for Stormwater Report

B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

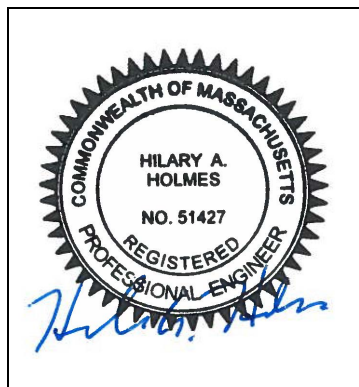
Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature



Hilary A. Holmes 9/3/2020

Signature and Date

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

- ☐ New development
- ☒ Redevelopment
- ☐ Mix of New Development and Redevelopment



Checklist for Stormwater Report

Checklist (continued)

LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

- ☒ No disturbance to any Wetland Resource Areas
- ☐ Site Design Practices (e.g. clustered development, reduced frontage setbacks)
- ☐ Reduced Impervious Area (Redevelopment Only)
- ☒ Minimizing disturbance to existing trees and shrubs
- ☐ LID Site Design Credit Requested:
 - ☐ Credit 1
 - ☐ Credit 2
 - ☐ Credit 3
- ☐ Use of "country drainage" versus curb and gutter conveyance and pipe
- ☒ Bioretention Cells (includes Rain Gardens)
- ☐ Constructed Stormwater Wetlands (includes Gravel Wetlands designs)
- ☐ Treebox Filter
- ☐ Water Quality Swale
- ☒ Grass Channel
- ☐ Green Roof
- ☒ Other (describe): Porous pavement for new paths

Standard 1: No New Untreated Discharges

- ☒ No new untreated discharges
- ☐ Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth
- ☐ Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.



Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

- ☐ Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.
- ☐ Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.
- ☒ Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

- ☒ Soil Analysis provided.
- ☒ Required Recharge Volume calculation provided.
- ☐ Required Recharge volume reduced through use of the LID site Design Credits.
- ☒ Sizing the infiltration, BMPs is based on the following method: Check the method used.
 - ☒ Static
 - ☐ Simple Dynamic
 - ☐ Dynamic Field¹
- ☐ Runoff from all impervious areas at the site discharging to the infiltration BMP.
- ☐ Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.
- ☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume.
- ☒ Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:
 - ☐ Site is comprised solely of C and D soils and/or bedrock at the land surface
 - ☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
 - ☐ Solid Waste Landfill pursuant to 310 CMR 19.000
 - ☒ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.
- ☒ Calculations showing that the infiltration BMPs will drain in 72 hours are provided.
- ☐ Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

¹ 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.



Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

- ☐ The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.
- ☐ Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
 - Provisions for storing materials and waste products inside or under cover;
 - Vehicle washing controls;
 - Requirements for routine inspections and maintenance of stormwater BMPs;
 - Spill prevention and response plans;
 - Provisions for maintenance of lawns, gardens, and other landscaped areas;
 - Requirements for storage and use of fertilizers, herbicides, and pesticides;
 - Pet waste management provisions;
 - Provisions for operation and management of septic systems;
 - Provisions for solid waste management;
 - Snow disposal and plowing plans relative to Wetland Resource Areas;
 - Winter Road Salt and/or Sand Use and Storage restrictions;
 - Street sweeping schedules;
 - Provisions for prevention of illicit discharges to the stormwater management system;
 - Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
 - Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
 - List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.
- ☐ A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.
 - ☐ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:
 - ☐ is within the Zone II or Interim Wellhead Protection Area
 - ☐ is near or to other critical areas
 - ☐ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
 - ☐ involves runoff from land uses with higher potential pollutant loads.
 - ☐ The Required Water Quality Volume is reduced through use of the LID site Design Credits.
 - ☐ Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.



Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

- ☒ The BMP is sized (and calculations provided) based on:
 - ☒ The ½" or 1" Water Quality Volume or
 - ☐ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.
- ☐ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.
- ☒ A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

- ☐ The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.
- ☐ The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted **prior to** the discharge of stormwater to the post-construction stormwater BMPs.
- ☐ The NPDES Multi-Sector General Permit does **not** cover the land use.
- ☐ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.
- ☐ All exposure has been eliminated.
- ☐ All exposure has **not** been eliminated and all BMPs selected are on MassDEP LUHPPL list.
- ☐ The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

- ☐ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.
- ☐ Critical areas and BMPs are identified in the Stormwater Report.



Checklist for Stormwater Report

Checklist (continued)

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

- ☒ The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:
 - ☐ Limited Project
 - ☐ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
 - ☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
 - ☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
 - ☐ Bike Path and/or Foot Path
- ☒ Redevelopment Project
- ☐ Redevelopment portion of mix of new and redevelopment.
- ☐ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.
- ☒ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
 - Construction Period Operation and Maintenance Plan;
 - Names of Persons or Entity Responsible for Plan Compliance;
 - Construction Period Pollution Prevention Measures;
 - Erosion and Sedimentation Control Plan Drawings;
 - Detail drawings and specifications for erosion control BMPs, including sizing calculations;
 - Vegetation Planning;
 - Site Development Plan;
 - Construction Sequencing Plan;
 - Sequencing of Erosion and Sedimentation Controls;
 - Operation and Maintenance of Erosion and Sedimentation Controls;
 - Inspection Schedule;
 - Maintenance Schedule;
 - Inspection and Maintenance Log Form.
- ☒ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.



Checklist for Stormwater Report

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

- ☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has **not** been included in the Stormwater Report but will be submitted **before** land disturbance begins.
- ☐ The project is **not** covered by a NPDES Construction General Permit.
- ☐ The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.
- ☐ The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

- ☒ The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:
 - ☒ Name of the stormwater management system owners;
 - ☒ Party responsible for operation and maintenance;
 - ☒ Schedule for implementation of routine and non-routine maintenance tasks;
 - ☒ Plan showing the location of all stormwater BMPs maintenance access areas;
 - ☒ Description and delineation of public safety features;
 - ☒ Estimated operation and maintenance budget; and
 - ☒ Operation and Maintenance Log Form.
- ☐ The responsible party is **not** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:
 - ☐ A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
 - ☐ A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

- ☐ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;
- ☒ An Illicit Discharge Compliance Statement is attached;
- ☐ NO Illicit Discharge Compliance Statement is attached but will be submitted **prior to** the discharge of any stormwater to post-construction BMPs.

1. Introduction

The Town of Arlington proposes improvements to a portion of the town-owned Wellington Park and the south bank of the adjacent town-owned segment of Mill Brook, located off Grove Street in Arlington, Massachusetts. The proposed work will be implemented in one phase. It will include regrading and installation of walking paths, landscape improvements including exploration play area, picnic table, educational/interpretive signage, removal of invasive plant materials (with replacement per Town regulations), and a water quality biobasin.

Existing lawn areas will require minimal grading, and they will be loamed and seeded. Existing invasive species will be removed and either replaced with no mow/native grasses. The following sections describe the stormwater implications of the proposed renovations, including design considerations and compliance with the Massachusetts Stormwater Standards.

2. Background and Existing Conditions

Soils map information is available from the Natural Resources Conservation Service Web Soil Survey.



Soils at Wellington Park are classified as Udorthents, wet substratum. Udorthents are areas from which soil has been excavated and/or deposited due to construction operations. These areas have been disturbed to such an extent that the natural layers of soil are no longer recognizable and are no longer a major factor in determining limitations or capabilities of the land. In the previous phase of the project, the site was surveyed and a series of test pits were excavated across the site. Soil data is available in a separate summary by W&S, dated 2018.

Based on the test pits shown in this report, soils generally consist of sandy and gravelly materials. Soil boring data can be found in Appendix D.

Land cover across the project area is consistent with its use as an existing park. The site is covered in grassed areas, with pedestrian paths. The park is bounded by Grove Street to the south, Prentiss Road and multi-family residential to the west, and Mill Brook to the immediate north and east. This project will disturb 22780 square feet or. 0.52 acres of land.

Stormwater runoff at the site presently consists of runoff from the path and from Prentiss Road into grassed/vegetated areas of the park. Runoff brings sediments and debris to the park that eventually can enter the brook. Soggy conditions of lawn are observed after rain events. There are no drainage utilities in the project area except for the stormwater storage and underdrains under existing tennis courts.

3. Stormwater Standards

Standard 1: No New Untreated Discharges

The proposed project will create no new untreated discharges. A new pedestrian path extension will be installed in place of informal existing compacted earth pathways; it will be installed as permeable pavement and will remain pervious. A picnic table over a concrete pad and small walkway extension leading to it is proposed. The amount of impervious surface being added is 160 sf and it is abutting a large grassed area.

The proposed biobasin with a sediment forebay (234 sf of new impervious area), will keep the sediments and trash away within the paved forebay and will direct runoff to the bioretention area. Bioretention area is designed to store and infiltrate the first flush runoff volume (0.5" of rainfall over the contributing impervious areas) and safely convey the runoff from larger storm frequencies through the outfall weir into the outfall grass swale in a controlled fashion.

Impervious surfaces are so small that they do not affect runoff curve numbers used in TR55 hydrologic calculations and the time of concentration for existing and proposed conditions also remain the same. The proposed biobasin is designed as a water quality control BMP. Due to the limitation of space and flat grades the basin will not provide noticeable reduction of peak discharges, however some attenuation is being achieved. The table below summarizes the pre- and post- discharge conditions from the entire park site. The hydrology report are included at the end of this section.

PEAK DISCHARGE SUMMARY					
STORM FREQUENCY	1-YEAR (CFS)	2-YEAR (CFS)	10-YEAR (CFS)	25-YEAR (CFS)	100-YEAR (CFS)
EXISTING	1.65	2.22	4.23	5.97	9.82
PROPOSED	1.64	2.21	4.21	5.94	9.76

Standard 3: Recharge

Due to the land cover under proposed conditions being similar to existing conditions and impervious areas being disconnected, additional recharge does not need to be provided; however, the biobasin is designed without underdrains and will provide required recharge volume based on contributing impervious areas. The calculations are included in the end of this section.

Standard 4: Water Quality

The proposed site improvements consist of one disconnected impervious area surrounded by large expanses of grassed park space. As such, no dedicated stormwater quality treatment facilities are required for the new improvements. The proposed biobasin is designed to treat runoff from off-site impervious areas to the maximum extent practicable. The water quality volume provided by the basin exceeds ½" of rainfall over the project and off-site impervious areas. The water quality calculations are included in the end of this section

Standard 5: Land Uses with Higher Potential Pollutant Loads (LUHPPLs)

Not applicable; the project is not subject to higher potential pollutant loads

Standard 6: Critical Areas

There will be no new discharge to critical areas.

Standard 7: Redevelopments and Other Projects Subject to the Standards Only to the Maximum Extent Practicable

This project consists of the redevelopment of an existing site. All attempts have been made to improve the existing stormwater conditions and meet the Massachusetts Stormwater Standards to the maximum extent practicable. This includes the use of Low Impact Development measures like porous pavement for new paths and disconnected impervious surfaces. In addition, the proposed biobasin will provide recharge and water quality control for of the off-site contributing areas.

Standard 8: Construction Period Pollution Prevention and Erosion and Sediment Control

A Construction Period Pollution Prevention and Erosion and Sediment Control plan has been created and is attached to the stormwater report

Standard 9: Operation and Maintenance Plan

An Operation and Maintenance plan has been created and is included in Appendix F.

Standard 10: Prohibition of Illicit Discharges

By the nature of the proposed work the majority of site improvements will be a passive use with an absence of structural drainage system. There will be no opportunity for illicit discharges into a stormwater drainage system.

ILLICIT DISCHARGE COMPLIANCE STATEMENT

Andrew Keel, PLA, Hatch, 27 Congress Street, Salem, MA 01970

Date: September 3, 2020

This statement is provided in accordance with the provisions of the Massachusetts Stormwater Management Standard 10 and of the Massachusetts Stormwater Management Handbook. Note the following:

- All stormwater management systems contain no connection to the site's wastewater sewer system or to any other non-stormwater collection system.
- Groundwater collection systems on the site are not connected to the site's wastewater sewer system or to any other non-stormwater collection system.
- The facility's Operations & Maintenance Plan is designed to prevent any discharge of non-stormwater to the drainage system.
- Any illicit discharges identified during or after construction will be immediately disconnected.

Conclusion

The project as designed is consistent with the intent of the Massachusetts Stormwater Standards, and that the design utilizes the best approach to minimizing offsite impacts

4. Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan

SECTION 1: Introduction

The Town of Arlington proposes improvements to a portion of the town-owned Wellington Park and the south bank of the adjacent town-owned segment of Mill Brook, located off Grove Street in Arlington, Massachusetts. The proposed work will be implemented in one phase. It will include regrading and installation of walking paths, landscape improvements including exploration play area, picnic table, educational/interpretive signage, removal of invasive plant materials (with replacement per Town regulations), and a water quality biobasin. A

Existing lawn areas will require minimal grading, and they will be loamed and seeded. Existing invasive species will be removed and either replaced with no mow/native grasses. The following sections describe the stormwater implications of the proposed renovations, including design considerations and compliance with the Massachusetts Stormwater Standards. As part of this project, this “Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan” has been created to ensure that no further disturbance to the wetland resource is created during the project.

Construction sequencing will follow these steps:

- Stake out limits of disturbance
- Install perimeter sedimentation barriers at downstream limits of grading or clearing
- Install tree protection measures
- Perform selective clearing and grubbing, including removal of invasive plants
- Stockpile any removed topsoil and install sedimentation barriers around stockpiles
- Grade areas for swale, pathways and exploration /play area. Apply temporary stabilization
- Install concrete forebay and weir wall.
- Install boardwalk transition, porous pavement pathways, other site furnishings and exploration area features
- Once adjacent disturbed areas are stabilized, excavate biobasin, install outlet concrete weir structure, and install stone and biosoil mix. Seed and mulch berm and surrounding areas.
- Install planting and plant protection fencing
- Once all project areas are fully stabilized, remove any remaining sedimentation barriers and re-stabilize and remaining disturbed areas.

SECTION 2: Construction Period Pollution Prevention Measures

Best Management Practices (BMPs) will be utilized as Construction Period Pollution Prevention Measures to reduce potential pollutants and prevent any off-site discharge. The objectives of the BMPs for construction activity are to minimize the disturbed areas, stabilize any disturbed areas, control the site perimeter and retain sediment. Both erosion and sedimentation controls and non-stormwater best management measures will be used to minimize site disturbance and ensure compliance with the performance standards of the WPA and Stormwater Standards. Measures will be taken to minimize the area disturbed by construction activities to reduce the

potential for soil erosion and stormwater pollution problems. In addition, good housekeeping measures will be followed for the day-to-day operation of the construction site under the control of the contractor to minimize the impact of construction. This section describes the control practices that will be in place during construction activities. Recommended control practices will comply with the standards set in the MA DEP Stormwater Policy Handbook.

2.1 Minimize Disturbed Area and Protect Natural Features and Soil

In order to minimize disturbed areas, work will be completed within well-defined work limits. These work limits are shown on the construction plans. The Contractor shall not disturb native vegetation in the undisturbed wetland area without prior approval from the Engineer. The Contractor will be responsible to make sure that all of their workers and any subcontractors know the proper work limits and do not extend their work into the undisturbed areas. The protective measures are described in more detail in the following sections.

2.2 Control Stormwater Flowing onto and through the project

Construction areas adjacent to wetland resources will be lined with compost filter sock. The socks will be inspected daily, and accumulated silt will be removed as needed.

2.3 Stabilize Soils

The Contractor shall limit the area of land which is exposed and free from vegetation during construction. In areas where the period of exposure will be greater than two (2) months, mulching, the use of erosion control mats, or other protective measures shall be provided as specified. The Contractor shall take account of the conditions of the soil where erosion control seeding will take place to ensure that materials used for re-vegetation are adaptive to the sediment control.

2.4 Proper Storage and Cover of Any Stockpiles

The location of the Contractor's storage areas for equipment and/or materials shall be upon cleared portions of the job site or areas to be cleared as a part of this project and shall require written approval of the Engineer. Adequate measures for erosion and sediment control such as the placement of compost filter socks around the downstream perimeter of stockpiles shall be employed to protect any downstream areas from siltation. There shall be no storage of equipment or materials in areas designated as wetlands. The Engineer may designate a particular area or areas where the Contractor may store materials used in his operations.

2.5 Perimeter Controls and Sediment Barriers

Erosion control measures, including perimeter controls (compost filter socks) are shown on the drawings in Appendix G, specifically on drawing SP-1 Site Preparation Plan.

2.6 Storm Drain Inlet Protection

There are no storm drains in the work area.

2.7 Retain Sediment On-Site

The Contractor will be responsible to monitor erosion control measures. Whenever necessary the Contractor will clear sediment from the compost filter tube and silt curtain that have been silted up during construction. Daily monitoring should be conducted and recorded.

2.8 Material Handling and Waste Management

Materials stored on-site will be stored in a neat, orderly manner in appropriate containers. Materials will be kept in their original containers with the original manufacturer's label. Substances will not be mixed with one another unless recommended by the manufacturer. Waste materials will be collected and stored in a securely lidded metal container from a licensed management company. The waste and any construction debris from the site will be hauled off-site daily and disposed of properly. The contractor will be responsible for waste removal. Manufacturer's recommendations for proper use and disposal will be followed for materials. Sanitary waste will be collected from the portable units a minimum of once a week, by a licensed sanitary waste management contractor.

2.9 Designated Washout Areas

The Contractor shall use washout facilities at their own facilities, unless otherwise directed by the Engineer.

2.10 Proper Equipment/Vehicle Fueling and Maintenance Practices

On-site vehicles will be monitored for leaks and receive regular preventative maintenance to reduce the risk of leakage. To ensure that leaks on stored equipment do not contaminate the site, oil-absorbing mats will be placed under oil-containing equipment during storage. Regular fueling and service of the equipment may be performed using approved methods and with care taken to minimize chance of spills. Repair of equipment or machinery within the 100' water resources area shall not be allowed without the prior approval of the Engineer. Any petroleum products will be stored in tightly sealed containers that are clearly labeled with spill control pads/socks placed under/around their perimeters.

2.11 Equipment/Vehicle Washing

The Contractor will be responsible to ensure that no equipment is washed on-site.

SECTION 3: Spill Prevention and Control Plan

The Contractor will be responsible for preventing spills in accordance with the project specifications and applicable federal, state and local regulations. The Contractor will identify a properly trained site employee, involved with the day-to-day site operations to be the spill prevention and cleanup coordinator. The name(s) of the responsible spill personnel will be posted on-site. Each employee will be instructed that all spills are to be reported to the spill prevention and cleanup coordinator.

3.1 Spill Control Equipment

Spill control/containment equipment will be kept in the Work Area. Materials and equipment necessary for spill cleanup will be kept either in the Work Area or in an otherwise accessible on-site location. Equipment and materials will include, but not be limited to, absorbent booms/mats, brooms, dust pans, mops, rags, gloves, goggles, sand, plastic and metal containers specifically for this purpose. It is the responsibility of the Contractor to ensure the inventory will be readily accessible and maintained.

3.2 Notification

Workers will be directed to inform the on-site supervisor of a spill event. The supervisor will assess the incident and initiate proper containment and response procedures immediately upon notification. Workers should avoid direct contact with spilled materials during the containment procedures. Primary notification of a spill should be made to the local Fire Department and Police Departments. Secondary Notification will be to the certified cleanup contractor if deemed necessary by Fire and/or Police personnel. The third level of notification (within 1 hour) is to the DEP or municipality's Licensed Site Professional (LSP). The specific cleanup contractor to be used will be identified by the Contractor prior to commencement of construction activities.

3.3 Spill Containment and Clean-Up Measures

Spills will be contained with granular sorbent material, sand, sorbent pads, booms or all of the above to prevent spreading. Certified cleanup contractors should complete spill cleanup. The material manufacturer's recommended methods for spill cleanup will be clearly posted and on-site personnel will be made aware of the procedures and the location of the information and cleanup supplies.

3.4 Hazardous Materials Spill Report

The Contractor will report and record any spill. The spill report will present a description of the release, including the quantity and type of material, date of the spill, circumstances leading to the release, location of spill, response actions and personnel, documentation of notifications and corrective measures implemented to prevent reoccurrence.

This document does not relieve the Contractor of the Federal reporting requirements of 40 CFR Part 110, 40 CFR Part 117, 40 CFR Part 302 and the State requirements specified under the Massachusetts Contingency Plan (M.C.P) relating to spills or other releases of oils or hazardous substances. Where a release containing a hazardous substance or oil in an amount equal to or in excess of a reportable quantity established under either 40 CFR Part 110, 40 CFR Part 117 or 40 CFR Part 302, occurs during a twenty-four (24) hour period, the Contractor is required to comply with the response requirements of the above mentioned regulations. Spills of oil or hazardous material in excess of the reportable quantity will be reported to the National Response Center (NRC).

SECTION 4: Contact Information/Responsible Parties

Owner/Operator:
Emily Sullivan
Arlington Conservation Commission
730 Massachusetts Avenue
Arlington, MA 02476
(781) 316-3012

Engineer:
Andrew Keel, PLA
Hatch
27 Congress Street
Salem, MA 01970
978-740-0096

Site Inspector: TBD

Contractor: TBD

SECTION 5: Erosion and Sedimentation Control

Erosion and Sedimentation Control Drawings can be found in the Appendix G, specifically on drawing SP-1 Site Preparation Plan.

SECTION 6: Site Development Plan

The Site Development Plan is included in the attached plans found in the Appendix G.

SECTION 7: Operation and Maintenance of Erosion Control

The erosion control measures will be installed as detailed on the drawings. If there is a failure to the controls the Contractor, under the supervision of the Engineer, will be required to stop work until the failure is repaired. Periodically throughout the work, whenever the Engineer deems it necessary, the sediment that has been deposited against the controls will be removed to ensure that the controls are working properly.

SECTION 8: Inspection Schedule

During construction, the erosion and sedimentation controls will be inspected daily. Once the Contractor is selected, an onsite inspector will be selected to work closely with the Engineer to ensure that erosion and sedimentation controls are in place and working properly. An Inspection Form is included below.

INSPECTION FORM

INSPECTED BY: _____ DATE: _____ TIME: _____

YES	NO	DOES NOT APPLY	ITEM
			Do any erosion/siltation control measures require repair or clean out to maintain adequate function?
			Is there any evidence that sediment is leaving the site and entering the wetlands?
			Are any temporary soil stockpiles or construction materials located in non-approved areas?
			Are on-site construction traffic routes, parking, and storage of equipment and supplies located in areas not specifically designed for them?

SPECIFIC LOCATION, CURRENT WEATHER CONDITIONS, AND ACTION TO BE TAKEN:

OTHER COMMENTS:

PENDING THE ACTIONS NOTED ABOVE I CERTIFY THAT THE SITE IS IN COMPLIANCE WITH THE CONSTRUCTION PERIOD POLLUTION PREVENTION AND EROSION AND SEDIMENTATION CONTROL PLAN.

SIGNATURE: _____ DATE: _____

Wellington Park - Revitalization of the Mill Brook Corridor
75% Design
Green Infrastructure Stormwater Calculations
Static Method

By: EUA
 Checked By: HH
 Date: 8/28/2020

Total Project Area(within LOD) (SF)	22,779
Open space/lawn/ parkland	20,377
Porous Asphalt (SF)	2,009
Impervious Area (SF)	393
Off-site Area draining to Biobasin (SF)	22,312
Impervious Area (SF)	21,156
Open space/lawn	1,156

Water Quality Volume Required (CF)	898
---	------------

(1/2" over impervious area)

Stormwater BMP Storage Volumes					
Stormwater BMP Facility	Total Drainage Area (SF)	Depth Of Layer (FT)	Void Ratio %	Storage Volume Provided (CF)	WQ Volume Required (CF)
Total Drainage Area (SF)	22,312				
Impervious Area (SF)	24,321				
Biobasin Ponding Area (SF)	933				
Biobasin Surface Area (SF)	700				
Temporary ponding		0.5	100%	408.25	
Biosoil mix		1.5	20%	279.90	
Stone later		1.0	40%	373.20	
Total				1061	898
% Water Quality Volume Requirement Met					118.2%

Hydrologic Soil Group Type A
 Target Depth Factor F (IN) 0.60
 Impervious Area to Biobasin ImpA (SF) 21,156

Recharge Volume Required Rv (CF)	RV=F*ImpA	1058
% Recharge Volume Requirement Met		100.3%

Soils based on borings loamy sand
 Infiltration Rawls rate F (IN/HR) 2.41
 Saturated Soil Conductivity (in/HR) 2.41
 Bottom Area A SF 933

Drawdown Time (HR)	T=Rv/(K*A)	5.65
Drawdown Time Requirement Met	72 hr max%	5.65 < 72

INSTRUCTIONS:

Version 1, Automated: Mar. 4, 2008

1. In BMP Column, click on Blue Cell to Activate Drop Down Menu
2. Select BMP from Drop Down Menu
3. After BMP is selected, TSS Removal and other Columns are automatically completed.

Location: Wellington Park, Arlington

TSS Removal
Calculation Worksheet

B	C	D	E	F
BMP ¹	TSS Removal Rate ¹	Starting TSS Load*	Amount Removed (C*D)	Remaining Load (D-E)
Bioretention Area	0.90	1.00	0.90	0.10
Grass Channel	0.50	0.10	0.05	0.05
	0.00	0.05	0.00	0.05
	0.00	0.05	0.00	0.05
	0.00	0.05	0.00	0.05

Total TSS Removal =

95%

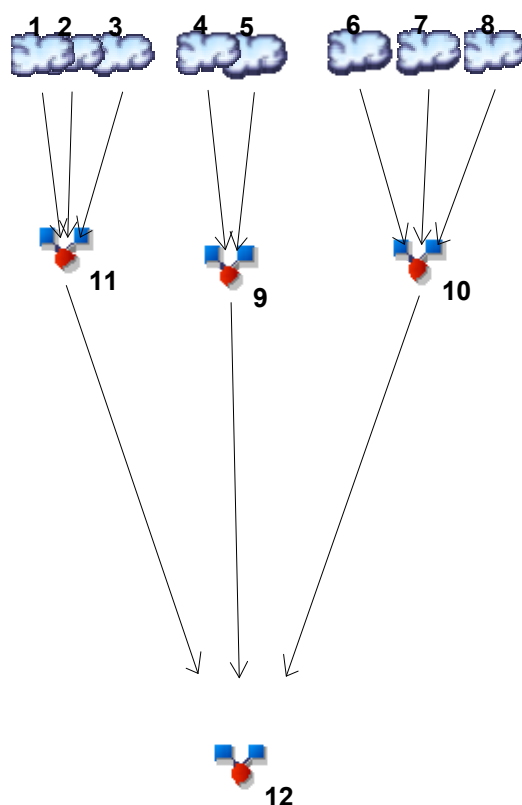
Separate Form Needs to
be Completed for Each
Outlet or BMP Train

Project: Wellington Park
Prepared By: E. Adamowicz
Date: 8/28/2020

*Equals remaining load from previous BMP (E)
which enters the BMP

Watershed Model Schematic

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v12



Legend

Hyd.	Origin	Description
1	SCS Runoff	TO END OF PRENTISS
2	SCS Runoff	LAWN- MIDDLE
3	SCS Runoff	LAWN LOWER
4	SCS Runoff	TO MILL BROOK WEST
5	SCS Runoff	TO MILL BROOK WEST-OFFSITE
6	SCS Runoff	TO MILL BROOK CENTER
7	SCS Runoff	TO MILL BROOK - RESTORATION
8	SCS Runoff	TO MILL BROOK EAST
9	Combine	WEST TO RIVER
10	Combine	EAST TO RIVER
11	Combine	TO RIVER- CENTER
12	Combine	TOTAL SITE

Hydrograph Return Period Recap

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v12

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)								Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	SCS Runoff	-----	1.303	1.578	-----	2.012	2.412	3.061	3.660	4.379	TO END OF PRENTISS
2	SCS Runoff	-----	0.005	0.018	-----	0.046	0.077	0.137	0.198	0.277	LAWN- MIDDLE
3	SCS Runoff	-----	0.003	0.009	-----	0.023	0.039	0.068	0.099	0.139	LAWN LOWER
4	SCS Runoff	-----	0.023	0.072	-----	0.185	0.313	0.551	0.794	1.108	TO MILL BROOK WEST
5	SCS Runoff	-----	0.293	0.353	-----	0.447	0.535	0.677	0.808	0.966	TO MILL BROOK WEST-OFFSITE
6	SCS Runoff	-----	0.057	0.147	-----	0.333	0.537	0.910	1.288	1.775	TO MILL BROOK CENTER
7	SCS Runoff	-----	0.009	0.030	-----	0.077	0.129	0.228	0.330	0.462	TO MILL BROOK - RESTORATION
8	SCS Runoff	-----	0.016	0.048	-----	0.123	0.208	0.367	0.529	0.739	TO MILL BROOK EAST
9	Combine	4, 5,	0.299	0.412	-----	0.624	0.839	1.221	1.599	2.074	WEST TO RIVER
10	Combine	6, 7, 8,	0.079	0.224	-----	0.530	0.866	1.490	2.135	2.963	EAST TO RIVER
11	Combine	1, 2, 3,	1.307	1.604	-----	2.081	2.528	3.263	3.951	4.784	TO RIVER- CENTER
12	Combine	9, 10, 11	1.652	2.217	-----	3.220	4.225	5.974	7.685	9.821	TOTAL SITE

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v12

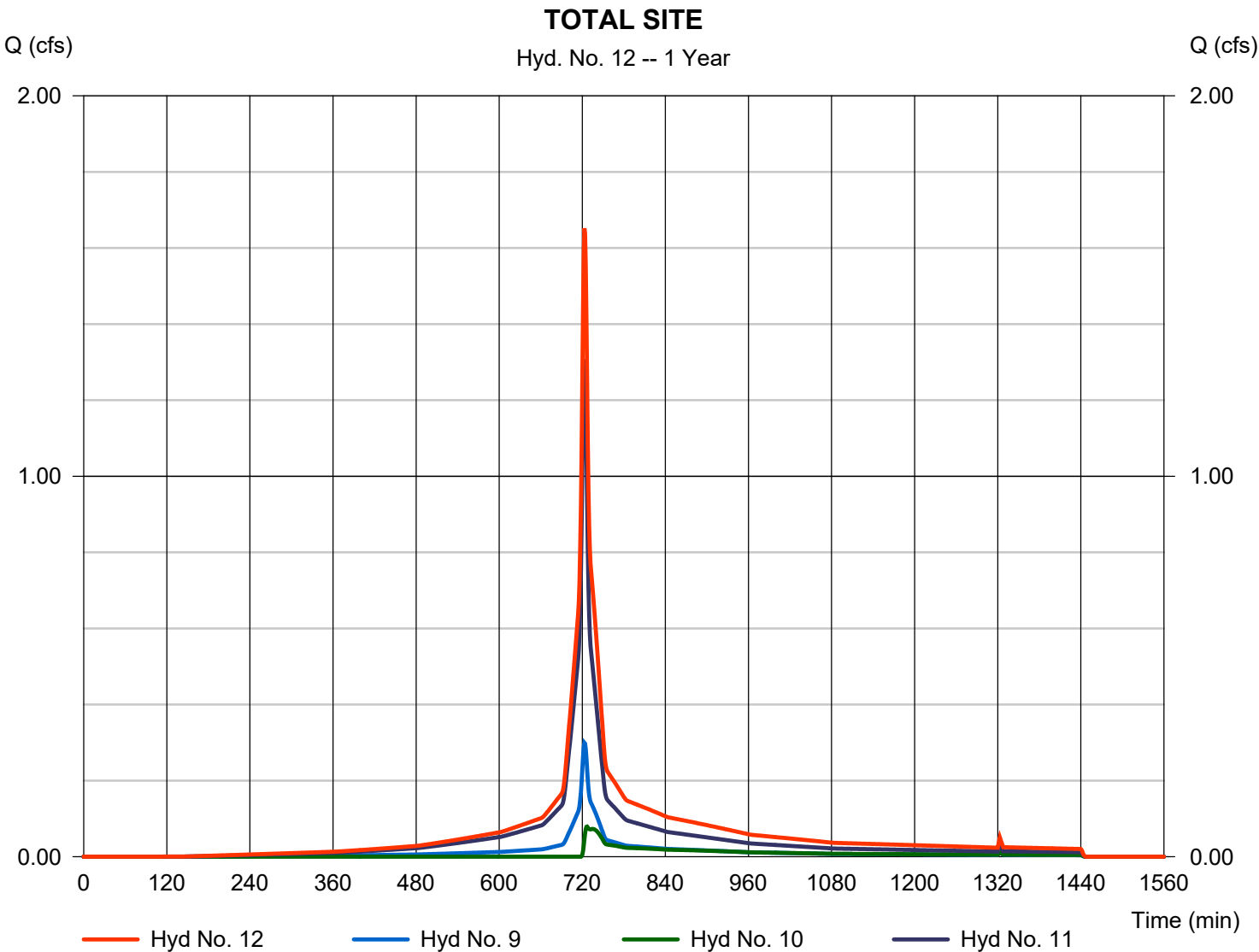
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	1.303	1	723	4,070	-----	-----	-----	TO END OF PRENTISS
2	SCS Runoff	0.005	1	735	45	-----	-----	-----	LAWN- MIDDLE
3	SCS Runoff	0.003	1	735	22	-----	-----	-----	LAWN LOWER
4	SCS Runoff	0.023	1	737	192	-----	-----	-----	TO MILL BROOK WEST
5	SCS Runoff	0.293	1	723	938	-----	-----	-----	TO MILL BROOK WEST-OFFSITE
6	SCS Runoff	0.057	1	726	355	-----	-----	-----	TO MILL BROOK CENTER
7	SCS Runoff	0.009	1	735	75	-----	-----	-----	TO MILL BROOK - RESTORATION
8	SCS Runoff	0.016	1	737	128	-----	-----	-----	TO MILL BROOK EAST
9	Combine	0.299	1	723	1,130	4, 5,	-----	-----	WEST TO RIVER
10	Combine	0.079	1	727	557	6, 7, 8,	-----	-----	EAST TO RIVER
11	Combine	1.307	1	723	4,138	1, 2, 3,	-----	-----	TO RIVER- CENTER
12	Combine	1.652	1	723	5,825	9, 10, 11	-----	-----	TOTAL SITE
									211 of 342
Existing H-H-OLD.gpw					Return Period: 1 Year			Thursday, 08 / 27 / 2020	

Hydrograph Report

Hyd. No. 12

TOTAL SITE

Hydrograph type	= Combine	Peak discharge	= 1.652 cfs
Storm frequency	= 1 yrs	Time to peak	= 723 min
Time interval	= 1 min	Hyd. volume	= 5,825 cuft
Inflow hyds.	= 9, 10, 11	Contrib. drain. area	= 0.000 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v12

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	1.578	1	723	4,987	-----	-----	-----	TO END OF PRENTISS
2	SCS Runoff	0.018	1	724	82	-----	-----	-----	LAWN- MIDDLE
3	SCS Runoff	0.009	1	724	41	-----	-----	-----	LAWN LOWER
4	SCS Runoff	0.072	1	725	348	-----	-----	-----	TO MILL BROOK WEST
5	SCS Runoff	0.353	1	723	1,141	-----	-----	-----	TO MILL BROOK WEST-OFFSITE
6	SCS Runoff	0.147	1	725	616	-----	-----	-----	TO MILL BROOK CENTER
7	SCS Runoff	0.030	1	724	136	-----	-----	-----	TO MILL BROOK - RESTORATION
8	SCS Runoff	0.048	1	725	232	-----	-----	-----	TO MILL BROOK EAST
9	Combine	0.412	1	723	1,490	4, 5,	-----	-----	WEST TO RIVER
10	Combine	0.224	1	725	984	6, 7, 8,	-----	-----	EAST TO RIVER
11	Combine	1.604	1	723	5,109	1, 2, 3,	-----	-----	TO RIVER- CENTER
12	Combine	2.217	1	723	7,583	9, 10, 11	-----	-----	TOTAL SITE
									213 of 342
Existing H-H-OLD.gpw					Return Period: 2 Year			Thursday, 08 / 27 / 2020	

Hydrograph Report

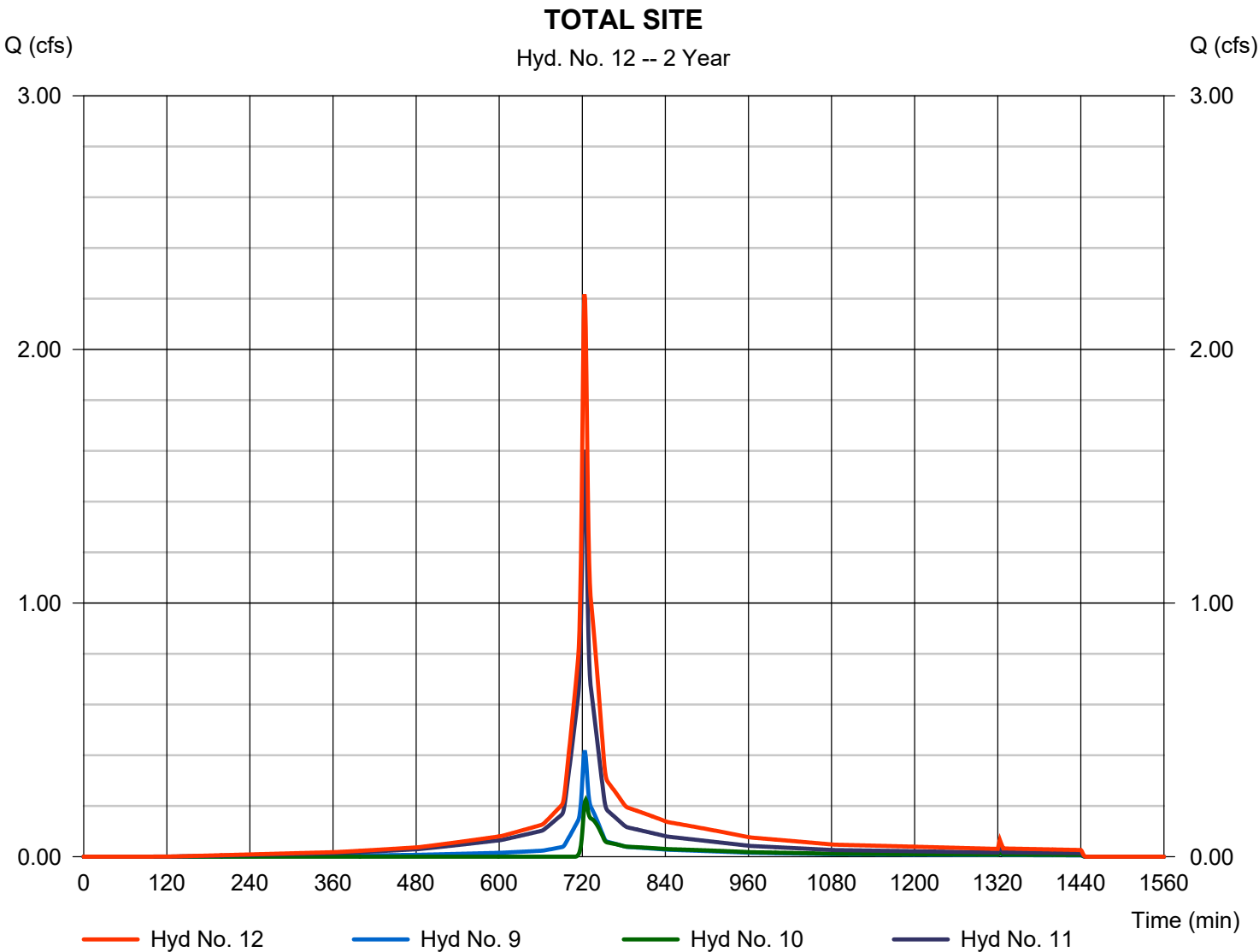
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v12

Thursday, 08 / 27 / 2020

Hyd. No. 12

TOTAL SITE

Hydrograph type	= Combine	Peak discharge	= 2.217 cfs
Storm frequency	= 2 yrs	Time to peak	= 723 min
Time interval	= 1 min	Hyd. volume	= 7,583 cuft
Inflow hyds.	= 9, 10, 11	Contrib. drain. area	= 0.000 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v12

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	2.012	1	723	6,447	-----	-----	-----	TO END OF PRENTISS
2	SCS Runoff	0.046	1	723	156	-----	-----	-----	LAWN- MIDDLE
3	SCS Runoff	0.023	1	723	78	-----	-----	-----	LAWN LOWER
4	SCS Runoff	0.185	1	724	664	-----	-----	-----	TO MILL BROOK WEST
5	SCS Runoff	0.447	1	723	1,464	-----	-----	-----	TO MILL BROOK WEST-OFFSITE
6	SCS Runoff	0.333	1	724	1,129	-----	-----	-----	TO MILL BROOK CENTER
7	SCS Runoff	0.077	1	723	259	-----	-----	-----	TO MILL BROOK - RESTORATION
8	SCS Runoff	0.123	1	724	443	-----	-----	-----	TO MILL BROOK EAST
9	Combine	0.624	1	723	2,128	4, 5,	-----	-----	WEST TO RIVER
10	Combine	0.530	1	724	1,831	6, 7, 8,	-----	-----	EAST TO RIVER
11	Combine	2.081	1	723	6,680	1, 2, 3,	-----	-----	TO RIVER- CENTER
12	Combine	3.220	1	723	10,639	9, 10, 11	-----	-----	TOTAL SITE
									215 of 342
Existing H-H-OLD.gpw					Return Period: 5 Year			Thursday, 08 / 27 / 2020	

Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v12

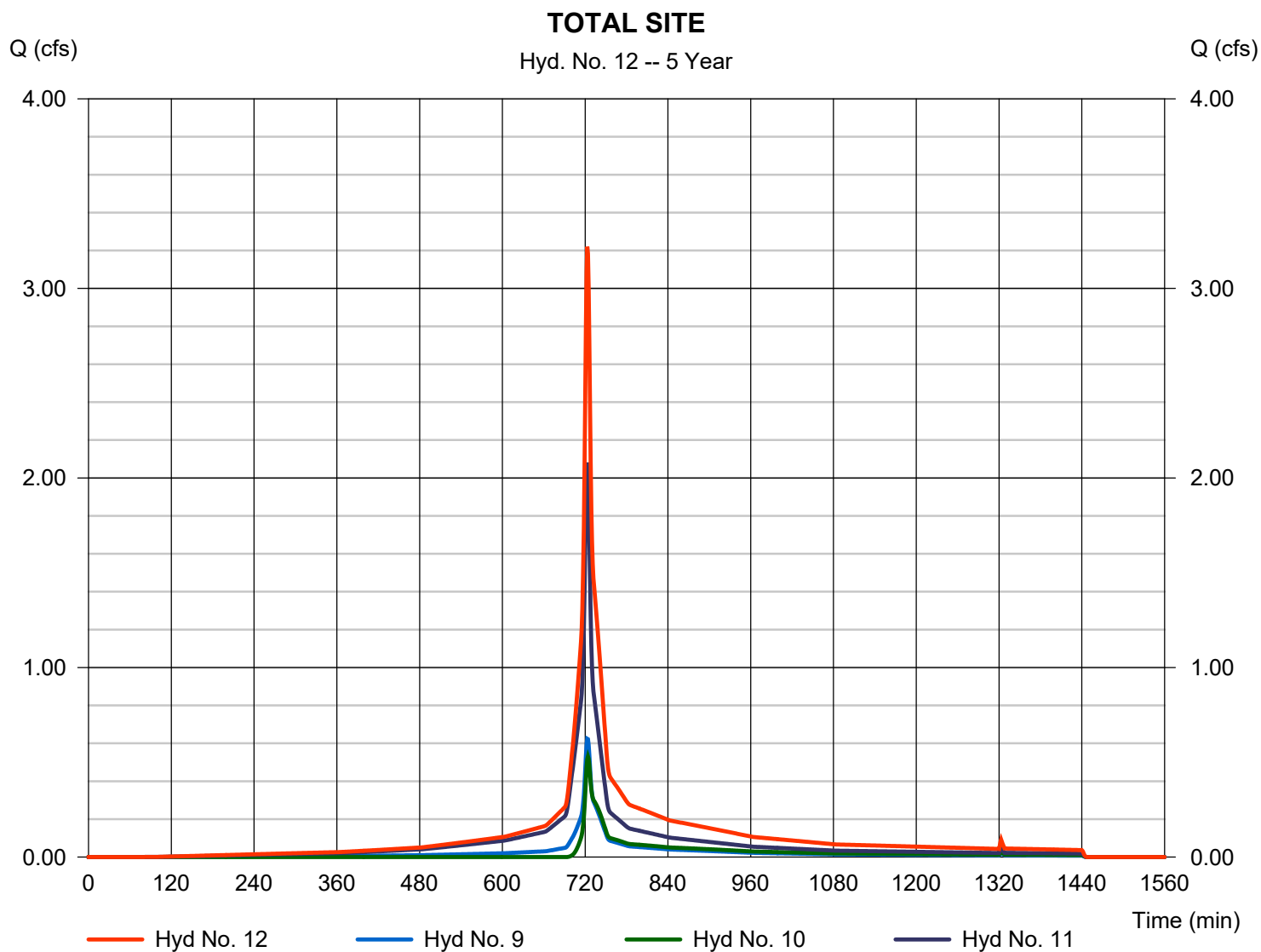
Thursday, 08 / 27 / 2020

Hyd. No. 12

TOTAL SITE

Hydrograph type = Combine
 Storm frequency = 5 yrs
 Time interval = 1 min
 Inflow hyds. = 9, 10, 11

Peak discharge = 3.220 cfs
 Time to peak = 723 min
 Hyd. volume = 10,639 cuft
 Contrib. drain. area = 0.000 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v12

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	2.412	1	723	7,802	-----	-----	-----	TO END OF PRENTISS
2	SCS Runoff	0.077	1	723	238	-----	-----	-----	LAWN- MIDDLE
3	SCS Runoff	0.039	1	723	119	-----	-----	-----	LAWN LOWER
4	SCS Runoff	0.313	1	724	1,014	-----	-----	-----	TO MILL BROOK WEST
5	SCS Runoff	0.535	1	723	1,762	-----	-----	-----	TO MILL BROOK WEST-OFFSITE
6	SCS Runoff	0.537	1	724	1,688	-----	-----	-----	TO MILL BROOK CENTER
7	SCS Runoff	0.129	1	723	396	-----	-----	-----	TO MILL BROOK - RESTORATION
8	SCS Runoff	0.208	1	724	676	-----	-----	-----	TO MILL BROOK EAST
9	Combine	0.839	1	723	2,776	4, 5,	-----	-----	WEST TO RIVER
10	Combine	0.866	1	724	2,761	6, 7, 8,	-----	-----	EAST TO RIVER
11	Combine	2.528	1	723	8,158	1, 2, 3,	-----	-----	TO RIVER- CENTER
12	Combine	4.225	1	723	13,695	9, 10, 11	-----	-----	TOTAL SITE
									217 of 342
Existing H-H-OLD.gpw					Return Period: 10 Year			Thursday, 08 / 27 / 2020	

Hydrograph Report

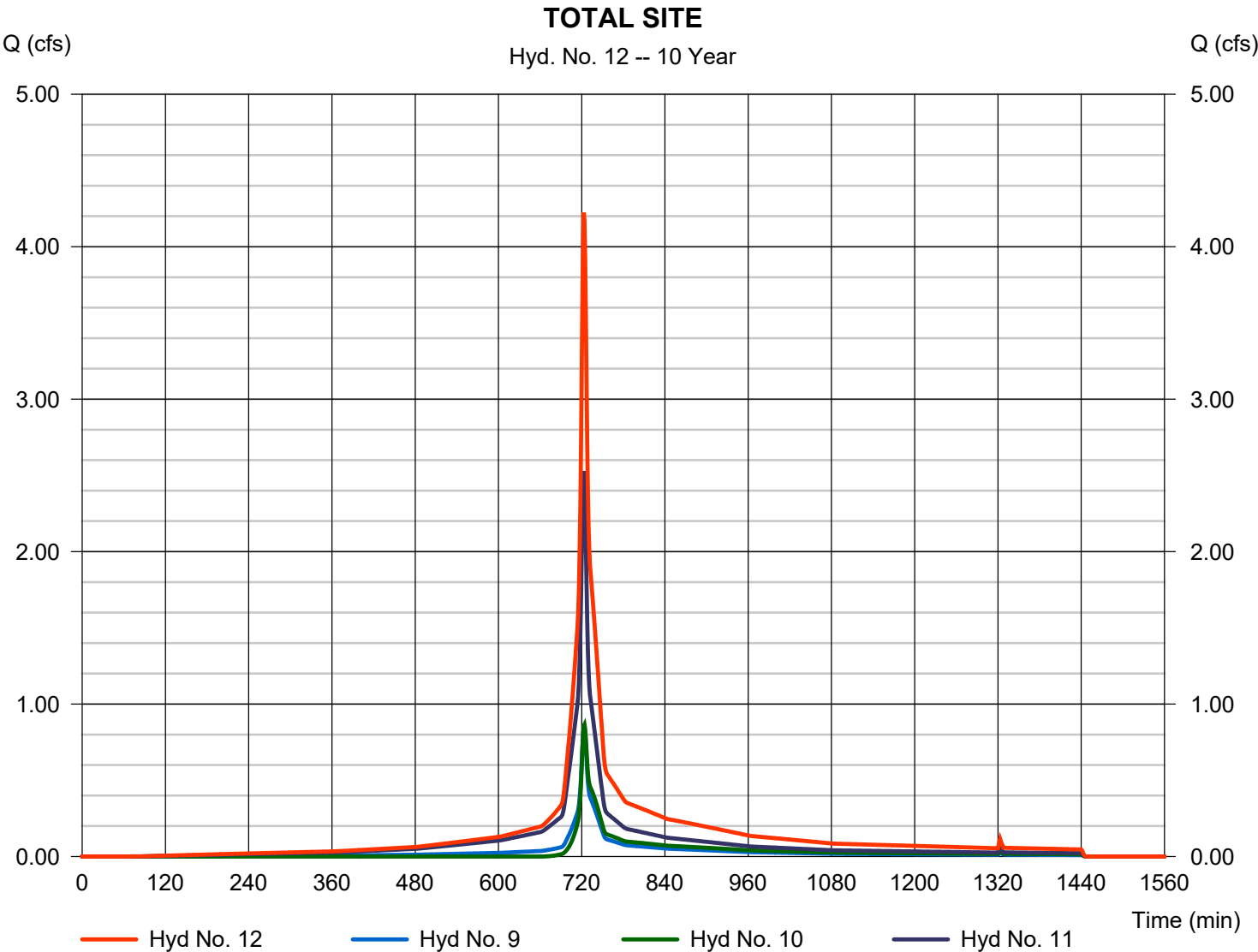
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v12

Thursday, 08 / 27 / 2020

Hyd. No. 12

TOTAL SITE

Hydrograph type	= Combine	Peak discharge	= 4.225 cfs
Storm frequency	= 10 yrs	Time to peak	= 723 min
Time interval	= 1 min	Hyd. volume	= 13,695 cuft
Inflow hyds.	= 9, 10, 11	Contrib. drain. area	= 0.000 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v12

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	3.061	1	723	10,009	-----	-----	-----	TO END OF PRENTISS
2	SCS Runoff	0.137	1	722	392	-----	-----	-----	LAWN- MIDDLE
3	SCS Runoff	0.068	1	722	196	-----	-----	-----	LAWN LOWER
4	SCS Runoff	0.551	1	724	1,672	-----	-----	-----	TO MILL BROOK WEST
5	SCS Runoff	0.677	1	723	2,249	-----	-----	-----	TO MILL BROOK WEST-OFFSITE
6	SCS Runoff	0.910	1	724	2,726	-----	-----	-----	TO MILL BROOK CENTER
7	SCS Runoff	0.228	1	722	653	-----	-----	-----	TO MILL BROOK - RESTORATION
8	SCS Runoff	0.367	1	724	1,115	-----	-----	-----	TO MILL BROOK EAST
9	Combine	1.221	1	723	3,921	4, 5,	-----	-----	WEST TO RIVER
10	Combine	1.490	1	723	4,494	6, 7, 8,	-----	-----	EAST TO RIVER
11	Combine	3.263	1	723	10,597	1, 2, 3,	-----	-----	TO RIVER- CENTER
12	Combine	5.974	1	723	19,011	9, 10, 11	-----	-----	TOTAL SITE
									219 of 342
Existing H-H-OLD.gpw					Return Period: 25 Year			Thursday, 08 / 27 / 2020	

Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v12

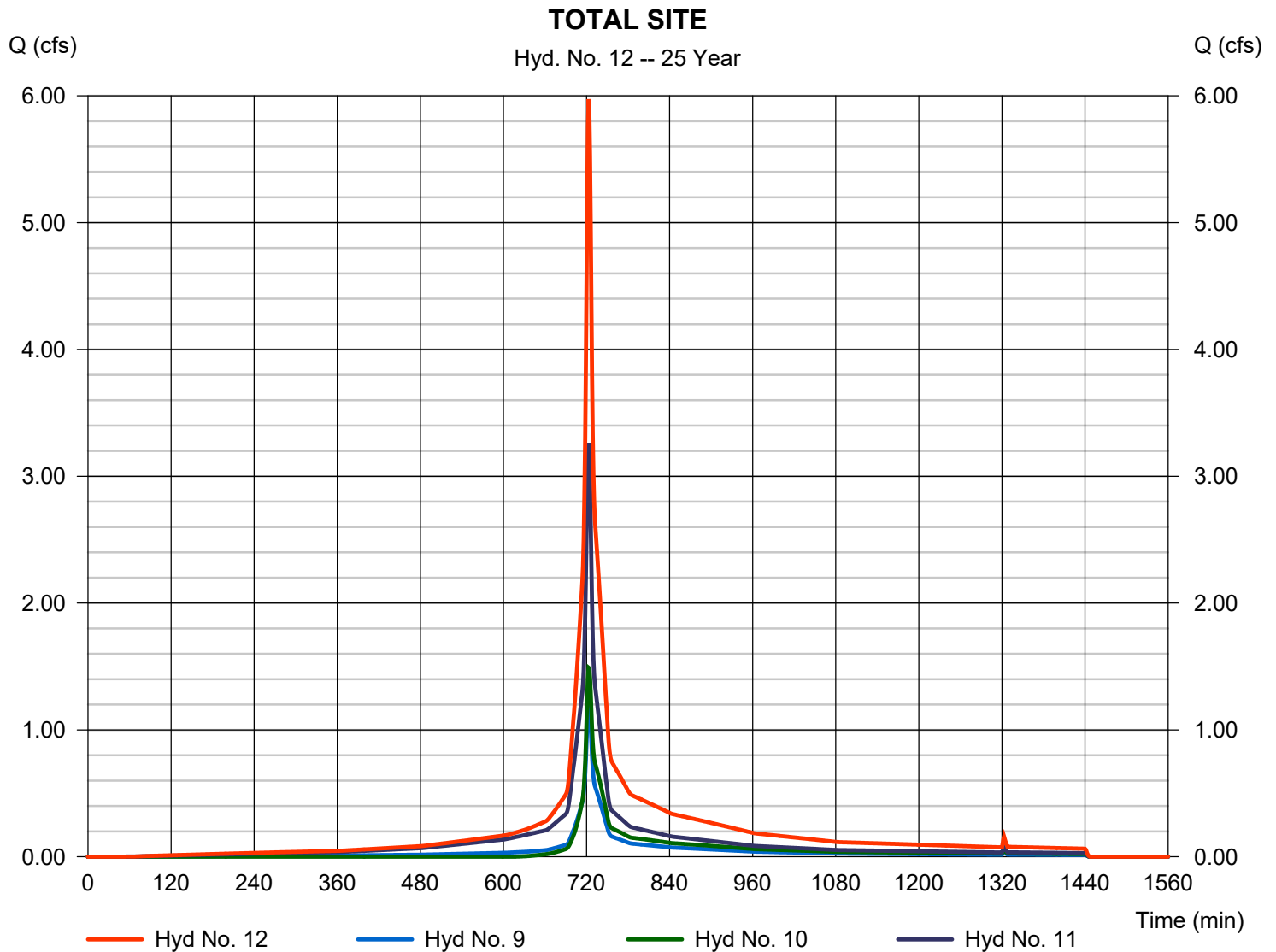
Thursday, 08 / 27 / 2020

Hyd. No. 12

TOTAL SITE

Hydrograph type = Combine
Storm frequency = 25 yrs
Time interval = 1 min
Inflow hyds. = 9, 10, 11

Peak discharge = 5.974 cfs
Time to peak = 723 min
Hyd. volume = 19,011 cuft
Contrib. drain. area = 0.000 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v12

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	3.660	1	723	12,055	-----	-----	-----	TO END OF PRENTISS
2	SCS Runoff	0.198	1	722	552	-----	-----	-----	LAWN- MIDDLE
3	SCS Runoff	0.099	1	722	276	-----	-----	-----	LAWN LOWER
4	SCS Runoff	0.794	1	724	2,354	-----	-----	-----	TO MILL BROOK WEST
5	SCS Runoff	0.808	1	723	2,700	-----	-----	-----	TO MILL BROOK WEST-OFFSITE
6	SCS Runoff	1.288	1	724	3,791	-----	-----	-----	TO MILL BROOK CENTER
7	SCS Runoff	0.330	1	722	920	-----	-----	-----	TO MILL BROOK - RESTORATION
8	SCS Runoff	0.529	1	724	1,569	-----	-----	-----	TO MILL BROOK EAST
9	Combine	1.599	1	723	5,054	4, 5,	-----	-----	WEST TO RIVER
10	Combine	2.135	1	723	6,280	6, 7, 8,	-----	-----	EAST TO RIVER
11	Combine	3.951	1	723	12,883	1, 2, 3,	-----	-----	TO RIVER- CENTER
12	Combine	7.685	1	723	24,216	9, 10, 11	-----	-----	TOTAL SITE
									221 of 342
Existing H-H-OLD.gpw					Return Period: 50 Year			Thursday, 08 / 27 / 2020	

Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v12

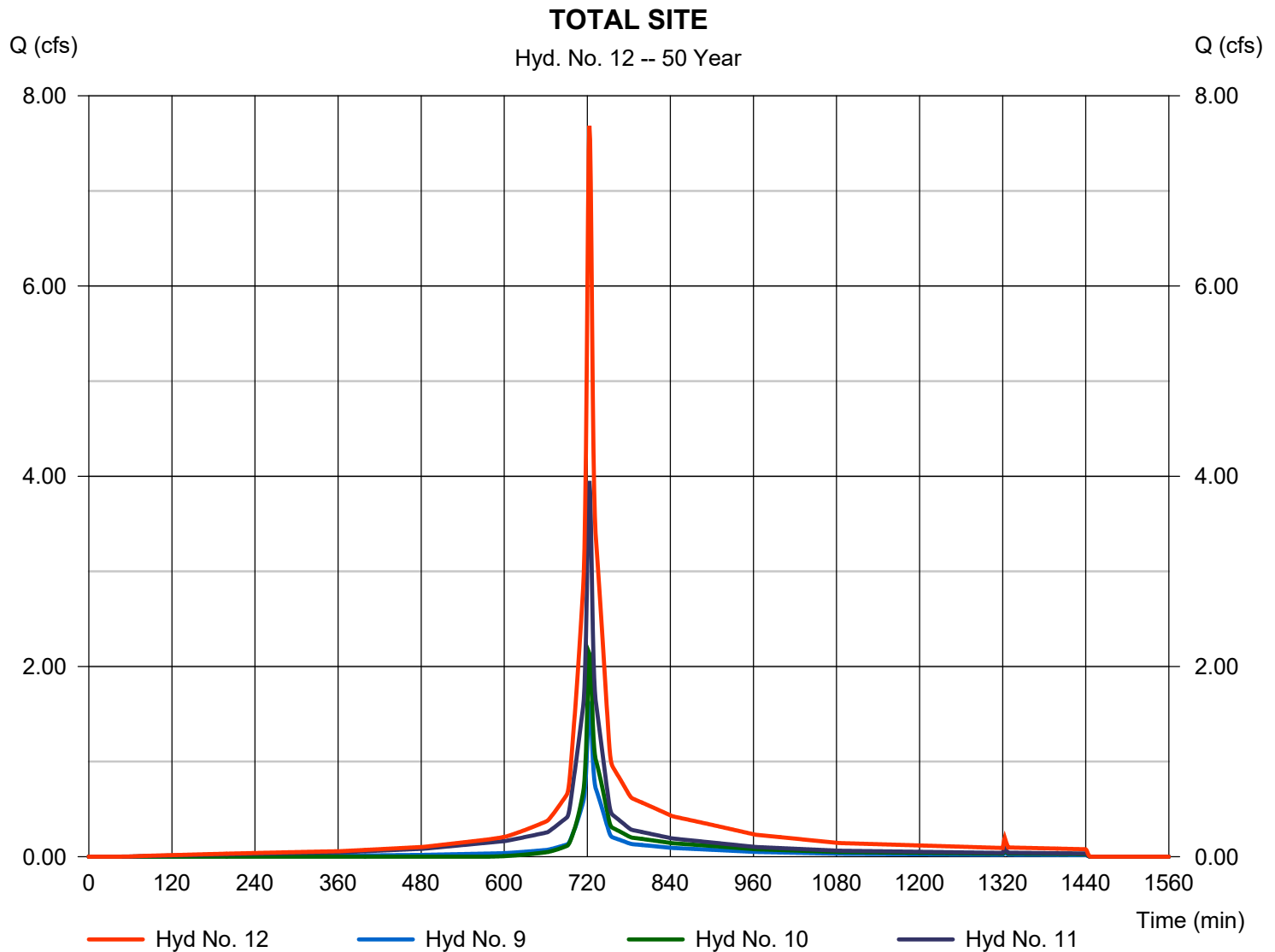
Thursday, 08 / 27 / 2020

Hyd. No. 12

TOTAL SITE

Hydrograph type = Combine
 Storm frequency = 50 yrs
 Time interval = 1 min
 Inflow hyds. = 9, 10, 11

Peak discharge = 7.685 cfs
 Time to peak = 723 min
 Hyd. volume = 24,216 cuft
 Contrib. drain. area = 0.000 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v12

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	4.379	1	723	14,520	-----	-----	-----	TO END OF PRENTISS
2	SCS Runoff	0.277	1	722	760	-----	-----	-----	LAWN- MIDDLE
3	SCS Runoff	0.139	1	722	380	-----	-----	-----	LAWN LOWER
4	SCS Runoff	1.108	1	723	3,242	-----	-----	-----	TO MILL BROOK WEST
5	SCS Runoff	0.966	1	723	3,242	-----	-----	-----	TO MILL BROOK WEST-OFFSITE
6	SCS Runoff	1.775	1	723	5,167	-----	-----	-----	TO MILL BROOK CENTER
7	SCS Runoff	0.462	1	722	1,266	-----	-----	-----	TO MILL BROOK - RESTORATION
8	SCS Runoff	0.739	1	723	2,161	-----	-----	-----	TO MILL BROOK EAST
9	Combine	2.074	1	723	6,484	4, 5,	-----	-----	WEST TO RIVER
10	Combine	2.963	1	723	8,595	6, 7, 8,	-----	-----	EAST TO RIVER
11	Combine	4.784	1	723	15,660	1, 2, 3,	-----	-----	TO RIVER- CENTER
12	Combine	9.821	1	723	30,739	9, 10, 11	-----	-----	TOTAL SITE
									223 of 342
Existing H-H-OLD.gpw					Return Period: 100 Year			Thursday, 08 / 27 / 2020	

Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v12

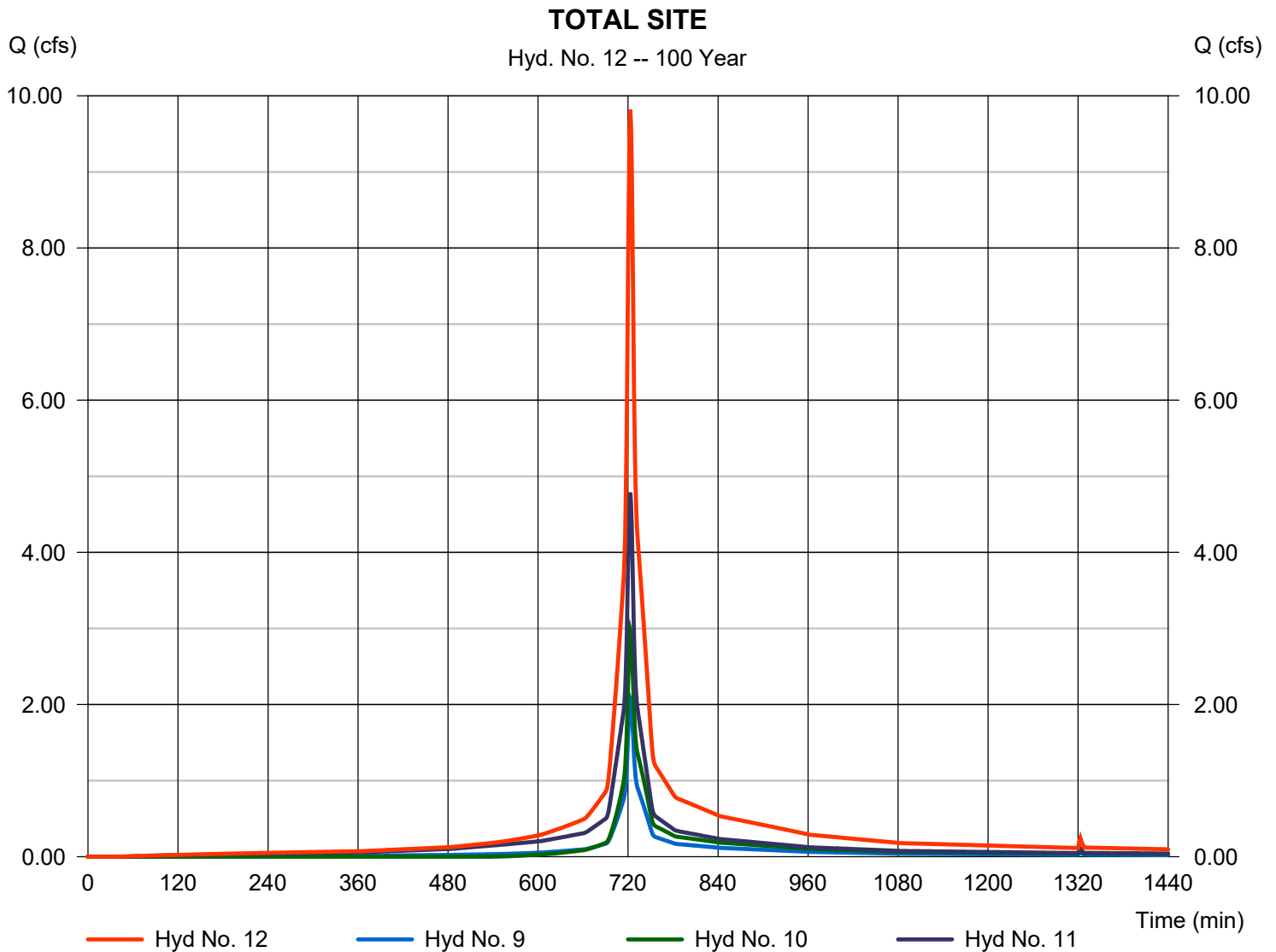
Thursday, 08 / 27 / 2020

Hyd. No. 12

TOTAL SITE

Hydrograph type = Combine
 Storm frequency = 100 yrs
 Time interval = 1 min
 Inflow hyds. = 9, 10, 11

Peak discharge = 9.821 cfs
 Time to peak = 723 min
 Hyd. volume = 30,739 cuft
 Contrib. drain. area = 0.000 ac



Hydraflow Rainfall Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v12

Thursday, 08 / 27 / 2020

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	-----
2	69.8703	13.1000	0.8658	-----
3	0.0000	0.0000	0.0000	-----
5	79.2597	14.6000	0.8369	-----
10	88.2351	15.5000	0.8279	-----
25	102.6072	16.5000	0.8217	-----
50	114.8193	17.2000	0.8199	-----
100	127.1596	17.8000	0.8186	-----

File name: SampleFHA.idf

$$\text{Intensity} = B / (T_c + D)^E$$

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	5.69	4.61	3.89	3.38	2.99	2.69	2.44	2.24	2.07	1.93	1.81	1.70
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	6.57	5.43	4.65	4.08	3.65	3.30	3.02	2.79	2.59	2.42	2.27	2.15
10	7.24	6.04	5.21	4.59	4.12	3.74	3.43	3.17	2.95	2.77	2.60	2.46
25	8.25	6.95	6.03	5.34	4.80	4.38	4.02	3.73	3.48	3.26	3.07	2.91
50	9.04	7.65	6.66	5.92	5.34	4.87	4.49	4.16	3.88	3.65	3.44	3.25
100	9.83	8.36	7.30	6.50	5.87	5.36	4.94	4.59	4.29	4.03	3.80	3.60

T_c = time in minutes. Values may exceed 60.

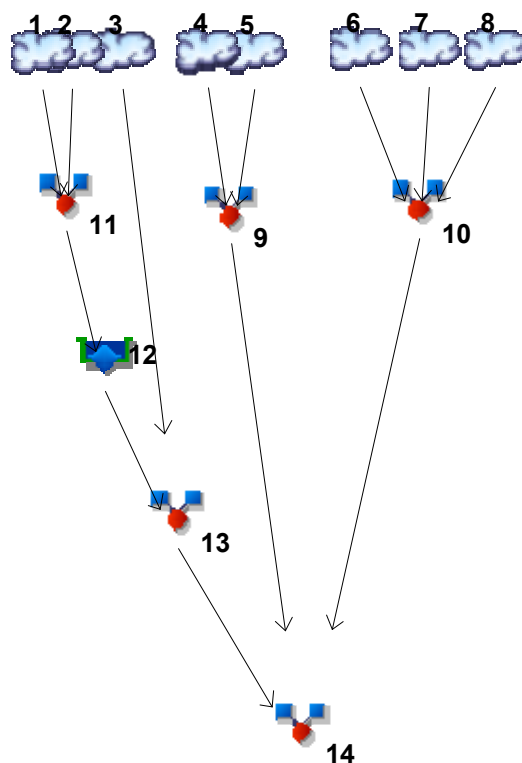
Precip. file name: Sample.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	2.58	3.09	0.00	3.90	4.65	5.87	7.00	8.36
SCS 6-Hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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Watershed Model Schematic

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v12



Legend

Hyd.	Origin	Description
1	SCS Runoff	TO FOREBAY
2	SCS Runoff	TO BIORETENTION DIRECT
3	SCS Runoff	TO END OF SWALE
4	SCS Runoff	TO MILL BROOK WEST
5	SCS Runoff	TO MILL BROOK WEST-OFFSITE
6	SCS Runoff	TO MILL BROOK CENTER
7	SCS Runoff	TO MILL BROOK - RESTORATION
8	SCS Runoff	TO MILL BROOK EAST
9	Combine	WEST TO RIVER
10	Combine	EAST TO RIVER
11	Combine	TO POND
12	Reservoir	OUT OF BR
13	Combine	TO SWALE OUTLET
14	Combine	TOTAL TO RIVER

Hydrograph Return Period Recap

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v12

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)								Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	SCS Runoff	-----	1.293	1.577	-----	2.024	2.435	3.100	3.714	4.450	TO FOREBAY
2	SCS Runoff	-----	0.005	0.018	-----	0.046	0.077	0.137	0.198	0.277	TO BIORETENTION DIRECT
3	SCS Runoff	-----	0.003	0.009	-----	0.023	0.039	0.068	0.099	0.139	TO END OF SWALE
4	SCS Runoff	-----	0.023	0.072	-----	0.185	0.313	0.551	0.794	1.108	TO MILL BROOK WEST
5	SCS Runoff	-----	0.293	0.353	-----	0.447	0.535	0.677	0.808	0.966	TO MILL BROOK WEST-OFFSITE
6	SCS Runoff	-----	0.057	0.147	-----	0.333	0.537	0.910	1.288	1.775	TO MILL BROOK CENTER
7	SCS Runoff	-----	0.009	0.030	-----	0.077	0.129	0.228	0.330	0.462	TO MILL BROOK - RESTORATION
8	SCS Runoff	-----	0.016	0.048	-----	0.123	0.208	0.367	0.529	0.739	TO MILL BROOK EAST
9	Combine	4, 5,	0.299	0.412	-----	0.624	0.839	1.221	1.599	2.074	WEST TO RIVER
10	Combine	6, 7, 8,	0.079	0.224	-----	0.530	0.866	1.490	2.135	2.963	EAST TO RIVER
11	Combine	1, 2,	1.296	1.594	-----	2.070	2.512	3.235	3.908	4.720	TO POND
12	Reservoir	11	1.277	1.570	-----	2.037	2.472	3.183	3.844	4.642	OUT OF BR
13	Combine	3, 12	1.279	1.579	-----	2.059	2.508	3.245	3.933	4.766	TO SWALE OUTLET
14	Combine	9, 10, 13	1.637	2.210	-----	3.211	4.210	5.943	7.632	9.755	TOTAL TO RIVER
											228 of 342
Proj. file: Proposed H-H.gpw									Thursday, 08 / 27 / 2020		

Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v12

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	1.293	1	723	3,961	-----	-----	-----	TO FOREBAY
2	SCS Runoff	0.005	1	735	45	-----	-----	-----	TO BIORETENTION DIRECT
3	SCS Runoff	0.003	1	735	22	-----	-----	-----	TO END OF SWALE
4	SCS Runoff	0.023	1	737	192	-----	-----	-----	TO MILL BROOK WEST
5	SCS Runoff	0.293	1	723	938	-----	-----	-----	TO MILL BROOK WEST-OFFSITE
6	SCS Runoff	0.057	1	726	355	-----	-----	-----	TO MILL BROOK CENTER
7	SCS Runoff	0.009	1	735	75	-----	-----	-----	TO MILL BROOK - RESTORATION
8	SCS Runoff	0.016	1	737	128	-----	-----	-----	TO MILL BROOK EAST
9	Combine	0.299	1	723	1,130	4, 5,	-----	-----	WEST TO RIVER
10	Combine	0.079	1	727	557	6, 7, 8,	-----	-----	EAST TO RIVER
11	Combine	1.296	1	723	4,006	1, 2,	-----	-----	TO POND
12	Reservoir	1.277	1	724	4,002	11	64.32	602	OUT OF BR
13	Combine	1.279	1	724	4,025	3, 12	-----	-----	TO SWALE OUTLET
14	Combine	1.637	1	724	5,712	9, 10, 13	-----	-----	TOTAL TO RIVER
									229 of 342
Proposed H-H.gpw					Return Period: 1 Year			Thursday, 08 / 27 / 2020	

Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v12

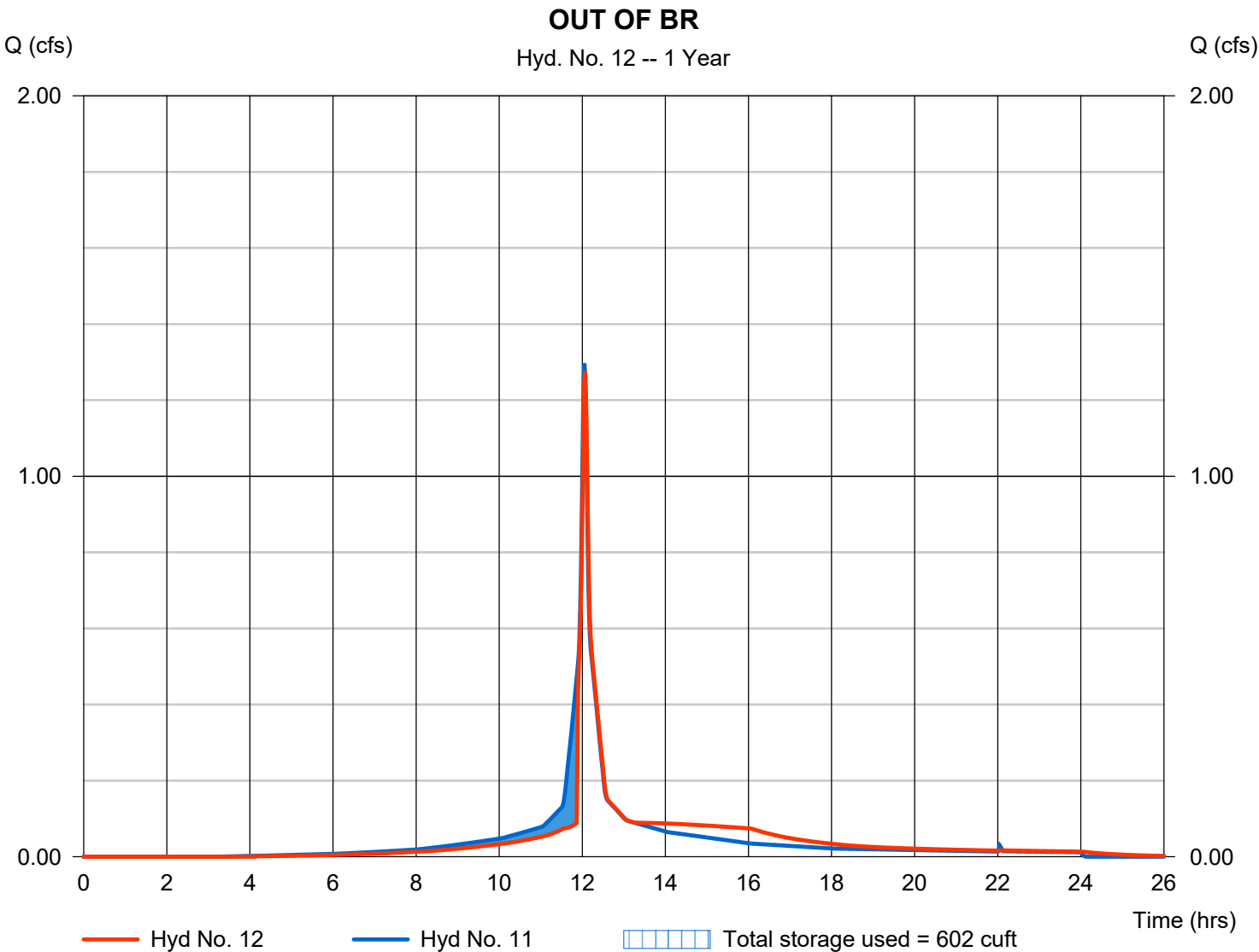
Thursday, 08 / 27 / 2020

Hyd. No. 12

OUT OF BR

Hydrograph type	= Reservoir	Peak discharge	= 1.277 cfs
Storm frequency	= 1 yrs	Time to peak	= 12.07 hrs
Time interval	= 1 min	Hyd. volume	= 4,002 cuft
Inflow hyd. No.	= 11 - TO POND	Max. Elevation	= 64.32 ft
Reservoir name	= BIORET	Max. Storage	= 602 cuft

Storage Indication method used. Outflow includes exfiltration.



Pond No. 1 - BIORET

Pond Data

Pond storage is based on user-defined values.

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	61.75	n/a	0	0
1.00	62.75	n/a	280	280
2.50	64.25	n/a	263	543
3.00	64.75	n/a	403	946
3.50	65.25	n/a	506	1,452
3.75	65.50	n/a	253	1,705
4.25	66.00	n/a	506	2,211

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 0.00	0.00	0.00	0.00
Span (in)	= 0.00	0.00	0.00	0.00
No. Barrels	= 0	0	0	0
Invert El. (ft)	= 0.00	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 4.00	5.00	20.00	0.00
Crest El. (ft)	= 64.75	65.25	65.50	0.00
Weir Coeff.	= 3.33	3.33	2.60	3.33
Weir Type	= Rect	Rect	Broad	---
Multi-Stage	= No	No	No	No
Exfil.(in/hr)	= 2.000 (by Wet area)			
TW Elev. (ft)	= 64.20			

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	61.75	---	---	---	---	0.00	0.00	0.00	---	0.000	---	0.000
1.00	280	62.75	---	---	---	---	0.00	0.00	0.00	---	0.032	---	0.074
2.50	543	64.25	---	---	---	---	0.00	0.00	0.00	---	0.038	---	0.089
3.00	946	64.75	---	---	---	---	0.00	0.00	0.00	---	0.000	---	8.760
3.50	1,452	65.25	---	---	---	---	0.00	0.00	0.00	---	0.000	---	20.02
3.75	1,705	65.50	---	---	---	---	0.00	0.00	0.00	---	0.000	---	93.56
4.25	2,211	66.00	---	---	---	---	0.00	0.00	0.00	---	0.000	---	302.10

Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v12

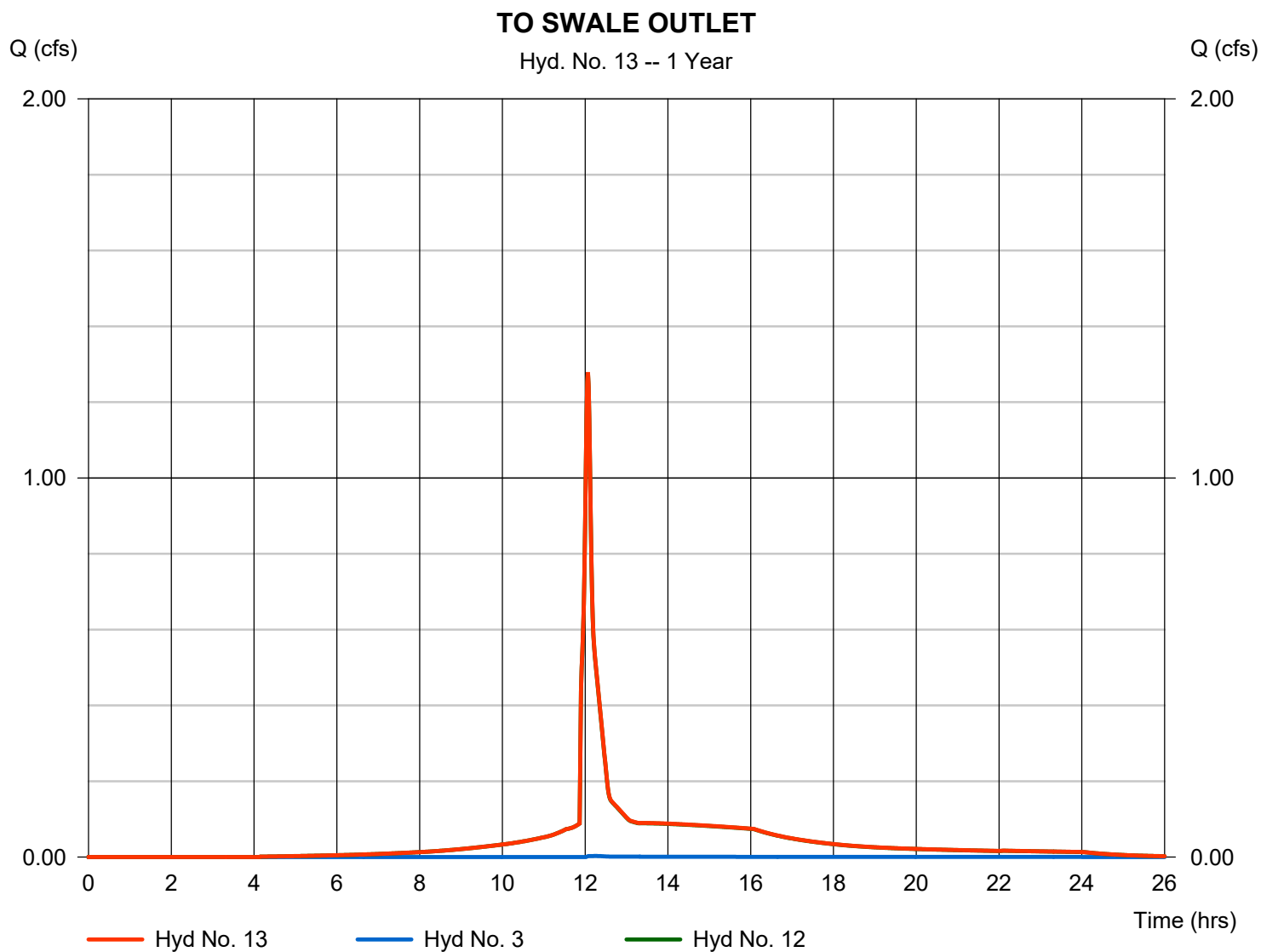
Thursday, 08 / 27 / 2020

Hyd. No. 13

TO SWALE OUTLET

Hydrograph type = Combine
 Storm frequency = 1 yrs
 Time interval = 1 min
 Inflow hyds. = 3, 12

Peak discharge = 1.279 cfs
 Time to peak = 12.07 hrs
 Hyd. volume = 4,025 cuft
 Contrib. drain. area = 0.030 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v12

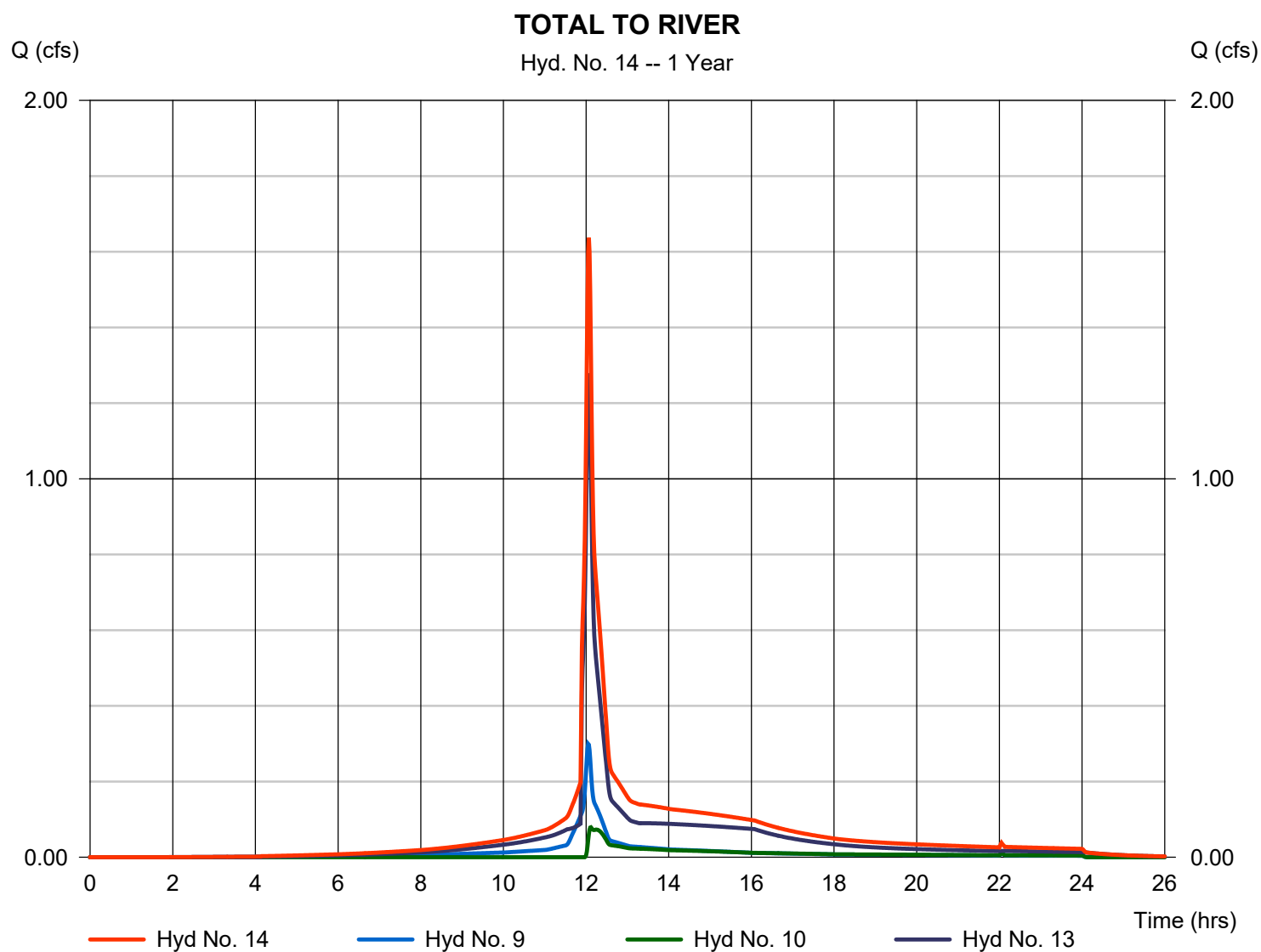
Thursday, 08 / 27 / 2020

Hyd. No. 14

TOTAL TO RIVER

Hydrograph type = Combine
 Storm frequency = 1 yrs
 Time interval = 1 min
 Inflow hyds. = 9, 10, 13

Peak discharge = 1.637 cfs
 Time to peak = 12.07 hrs
 Hyd. volume = 5,712 cuft
 Contrib. drain. area = 0.000 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v12

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	1.577	1	723	4,889	-----	-----	-----	TO FOREBAY
2	SCS Runoff	0.018	1	724	82	-----	-----	-----	TO BIORETENTION DIRECT
3	SCS Runoff	0.009	1	724	41	-----	-----	-----	TO END OF SWALE
4	SCS Runoff	0.072	1	725	348	-----	-----	-----	TO MILL BROOK WEST
5	SCS Runoff	0.353	1	723	1,141	-----	-----	-----	TO MILL BROOK WEST-OFFSITE
6	SCS Runoff	0.147	1	725	616	-----	-----	-----	TO MILL BROOK CENTER
7	SCS Runoff	0.030	1	724	136	-----	-----	-----	TO MILL BROOK - RESTORATION
8	SCS Runoff	0.048	1	725	232	-----	-----	-----	TO MILL BROOK EAST
9	Combine	0.412	1	723	1,490	4, 5,	-----	-----	WEST TO RIVER
10	Combine	0.224	1	725	984	6, 7, 8,	-----	-----	EAST TO RIVER
11	Combine	1.594	1	723	4,970	1, 2,	-----	-----	TO POND
12	Reservoir	1.570	1	724	4,967	11	64.34	615	OUT OF BR
13	Combine	1.579	1	724	5,007	3, 12	-----	-----	TO SWALE OUTLET
14	Combine	2.210	1	724	7,481	9, 10, 13	-----	-----	TOTAL TO RIVER
									234 of 342
Proposed H-H.gpw					Return Period: 2 Year			Thursday, 08 / 27 / 2020	

Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v12

Thursday, 08 / 27 / 2020

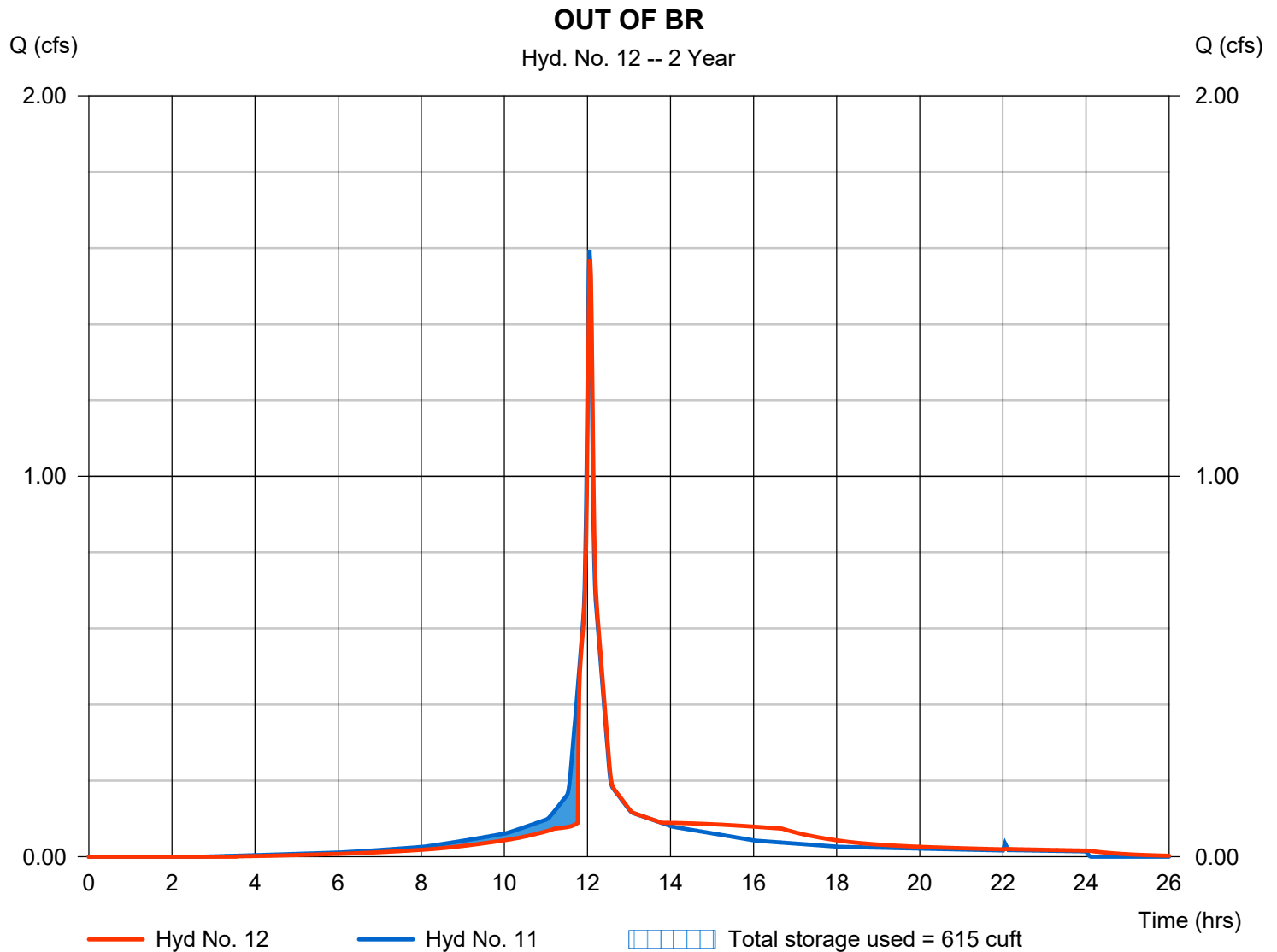
Hyd. No. 12

OUT OF BR

Hydrograph type = Reservoir
 Storm frequency = 2 yrs
 Time interval = 1 min
 Inflow hyd. No. = 11 - TO POND
 Reservoir name = BIORET

Peak discharge = 1.570 cfs
 Time to peak = 12.07 hrs
 Hyd. volume = 4,967 cuft
 Max. Elevation = 64.34 ft
 Max. Storage = 615 cuft

Storage Indication method used. Outflow includes exfiltration.



Hydrograph Report

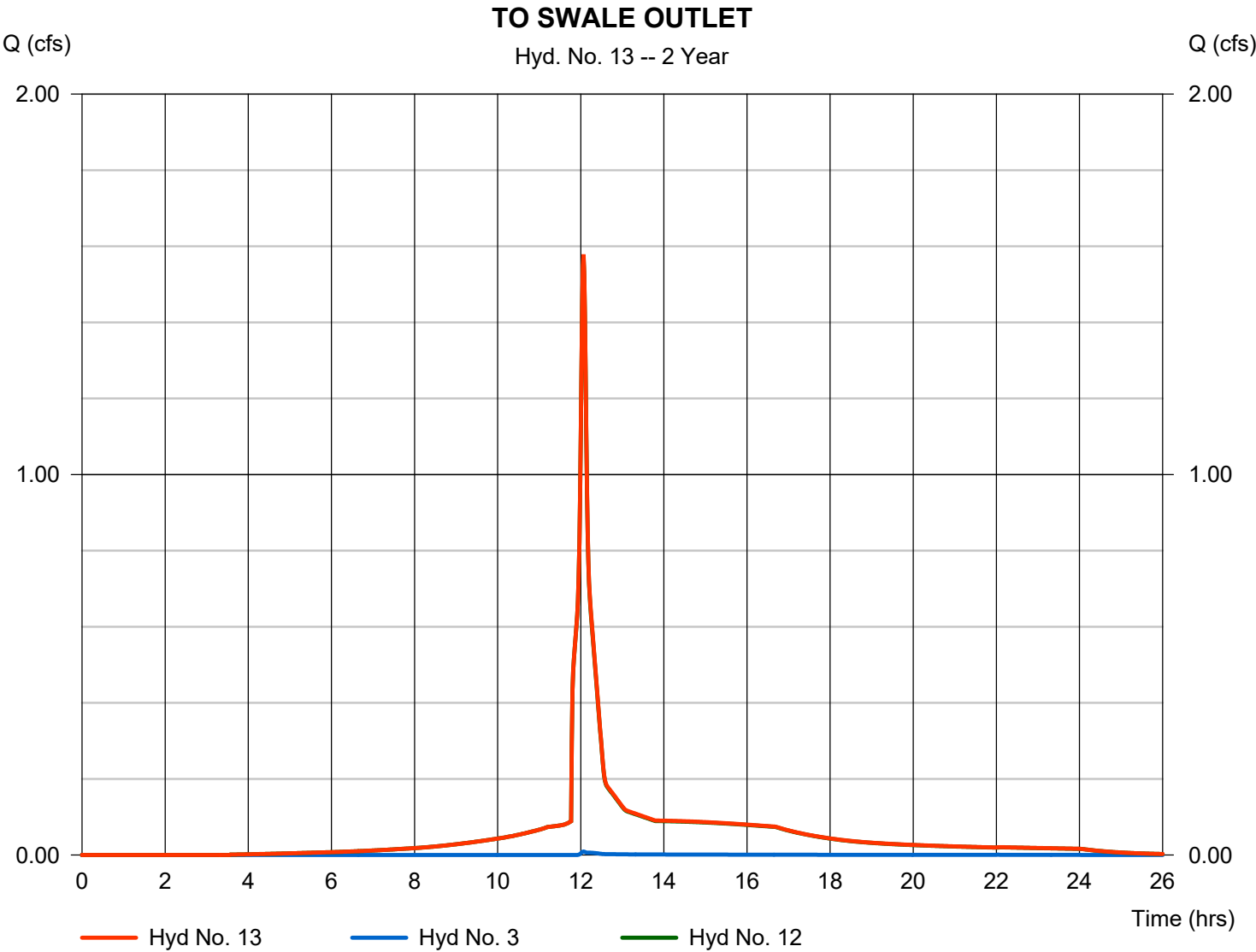
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v12

Thursday, 08 / 27 / 2020

Hyd. No. 13

TO SWALE OUTLET

Hydrograph type	= Combine	Peak discharge	= 1.579 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.07 hrs
Time interval	= 1 min	Hyd. volume	= 5,007 cuft
Inflow hyds.	= 3, 12	Contrib. drain. area	= 0.030 ac



Hydrograph Report

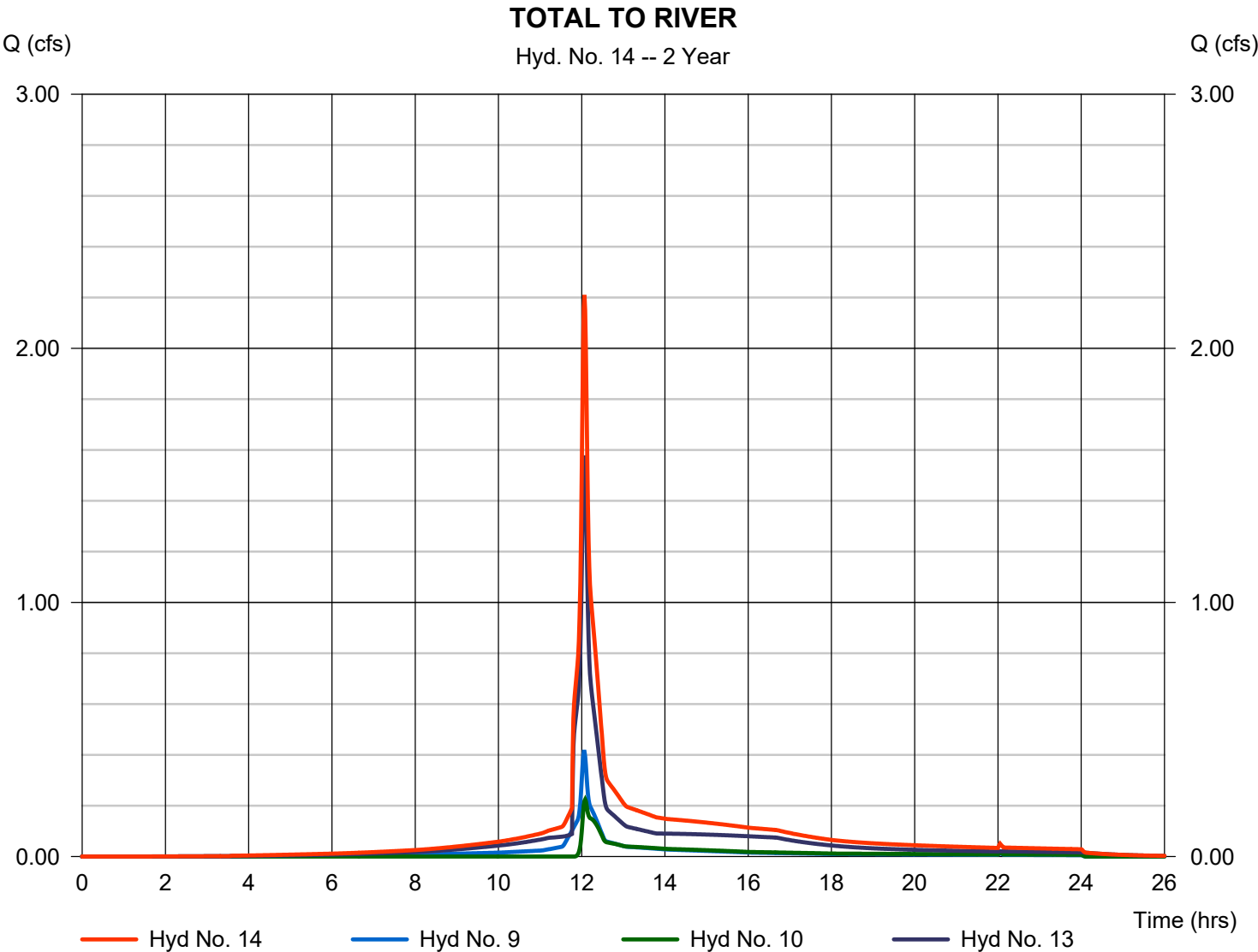
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v12

Thursday, 08 / 27 / 2020

Hyd. No. 14

TOTAL TO RIVER

Hydrograph type	= Combine	Peak discharge	= 2.210 cfs
Storm frequency	= 2 yrs	Time to peak	= 12.07 hrs
Time interval	= 1 min	Hyd. volume	= 7,481 cuft
Inflow hyds.	= 9, 10, 13	Contrib. drain. area	= 0.000 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v12

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	2.024	1	723	6,370	-----	-----	-----	TO FOREBAY
2	SCS Runoff	0.046	1	723	156	-----	-----	-----	TO BIORETENTION DIRECT
3	SCS Runoff	0.023	1	723	78	-----	-----	-----	TO END OF SWALE
4	SCS Runoff	0.185	1	724	664	-----	-----	-----	TO MILL BROOK WEST
5	SCS Runoff	0.447	1	723	1,464	-----	-----	-----	TO MILL BROOK WEST-OFFSITE
6	SCS Runoff	0.333	1	724	1,129	-----	-----	-----	TO MILL BROOK CENTER
7	SCS Runoff	0.077	1	723	259	-----	-----	-----	TO MILL BROOK - RESTORATION
8	SCS Runoff	0.123	1	724	443	-----	-----	-----	TO MILL BROOK EAST
9	Combine	0.624	1	723	2,128	4, 5,	-----	-----	WEST TO RIVER
10	Combine	0.530	1	724	1,831	6, 7, 8,	-----	-----	EAST TO RIVER
11	Combine	2.070	1	723	6,526	1, 2,	-----	-----	TO POND
12	Reservoir	2.037	1	724	6,522	11	64.37	637	OUT OF BR
13	Combine	2.059	1	724	6,600	3, 12	-----	-----	TO SWALE OUTLET
14	Combine	3.211	1	724	10,559	9, 10, 13	-----	-----	TOTAL TO RIVER
Proposed H-H.gpw					Return Period: 5 Year			Thursday, 08 / 27 / 2020	

Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v12

Thursday, 08 / 27 / 2020

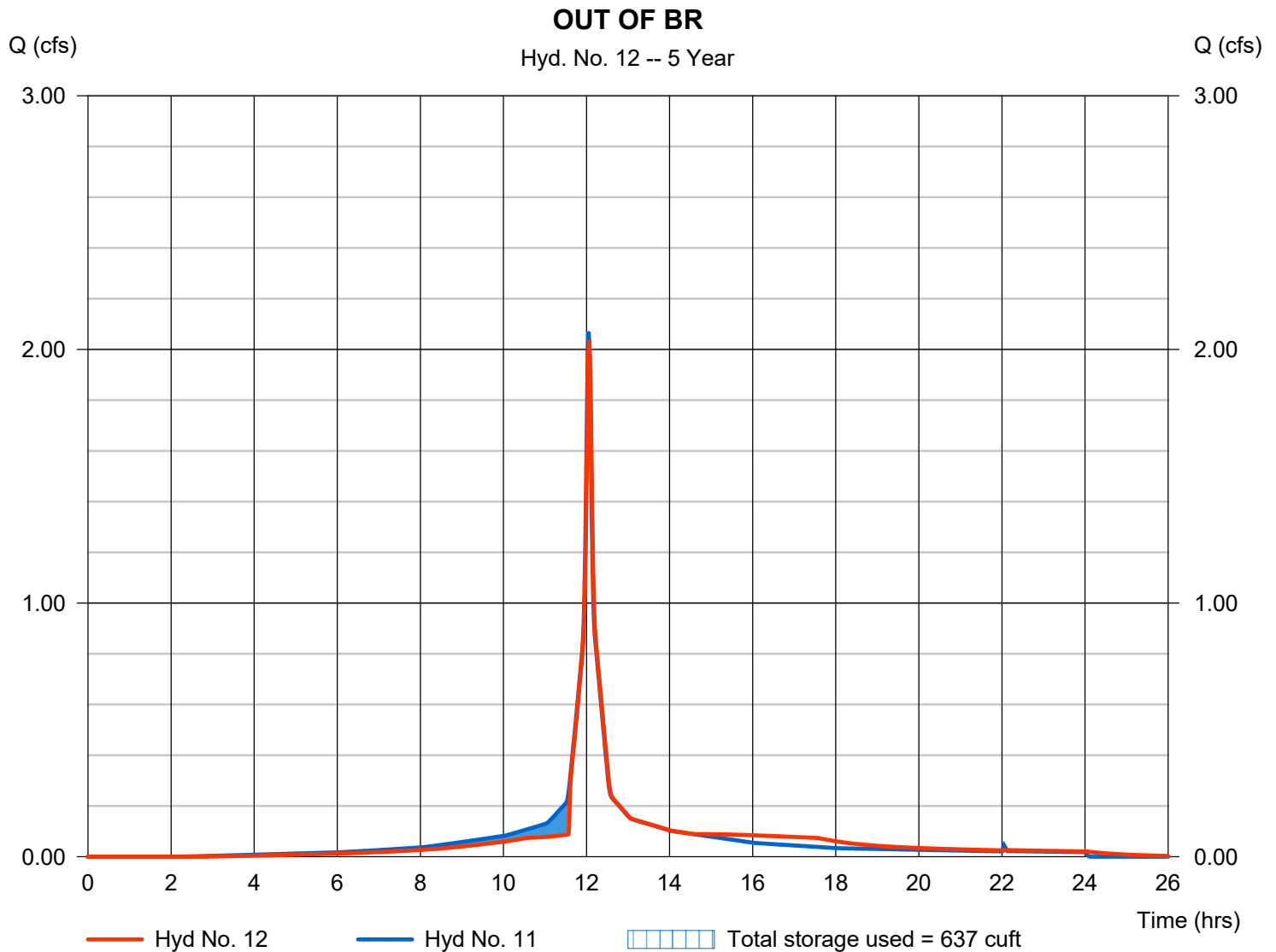
Hyd. No. 12

OUT OF BR

Hydrograph type = Reservoir
 Storm frequency = 5 yrs
 Time interval = 1 min
 Inflow hyd. No. = 11 - TO POND
 Reservoir name = BIORET

Peak discharge = 2.037 cfs
 Time to peak = 12.07 hrs
 Hyd. volume = 6,522 cuft
 Max. Elevation = 64.37 ft
 Max. Storage = 637 cuft

Storage Indication method used. Outflow includes exfiltration.



Hydrograph Report

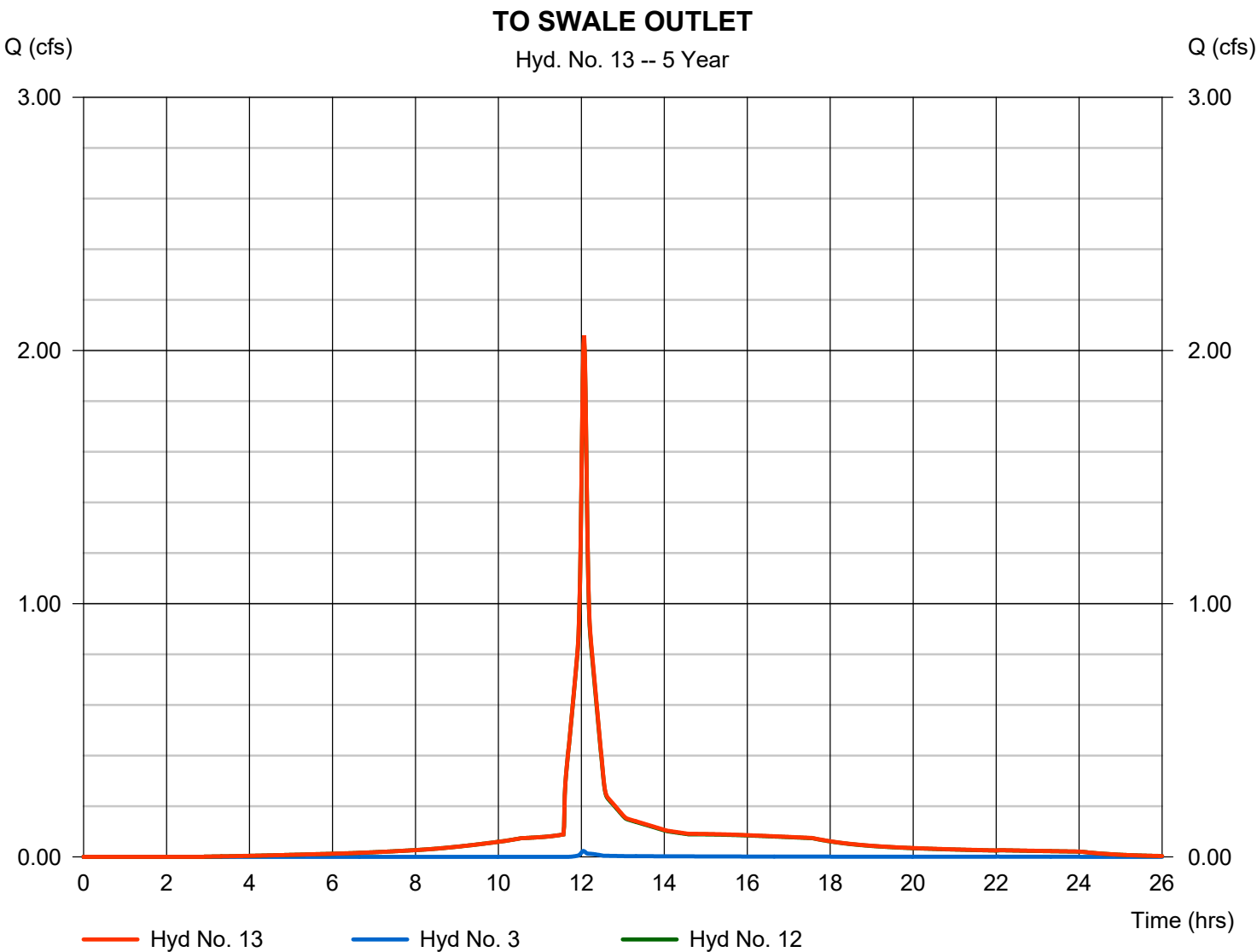
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v12

Thursday, 08 / 27 / 2020

Hyd. No. 13

TO SWALE OUTLET

Hydrograph type	= Combine	Peak discharge	= 2.059 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.07 hrs
Time interval	= 1 min	Hyd. volume	= 6,600 cuft
Inflow hyds.	= 3, 12	Contrib. drain. area	= 0.030 ac



Hydrograph Report

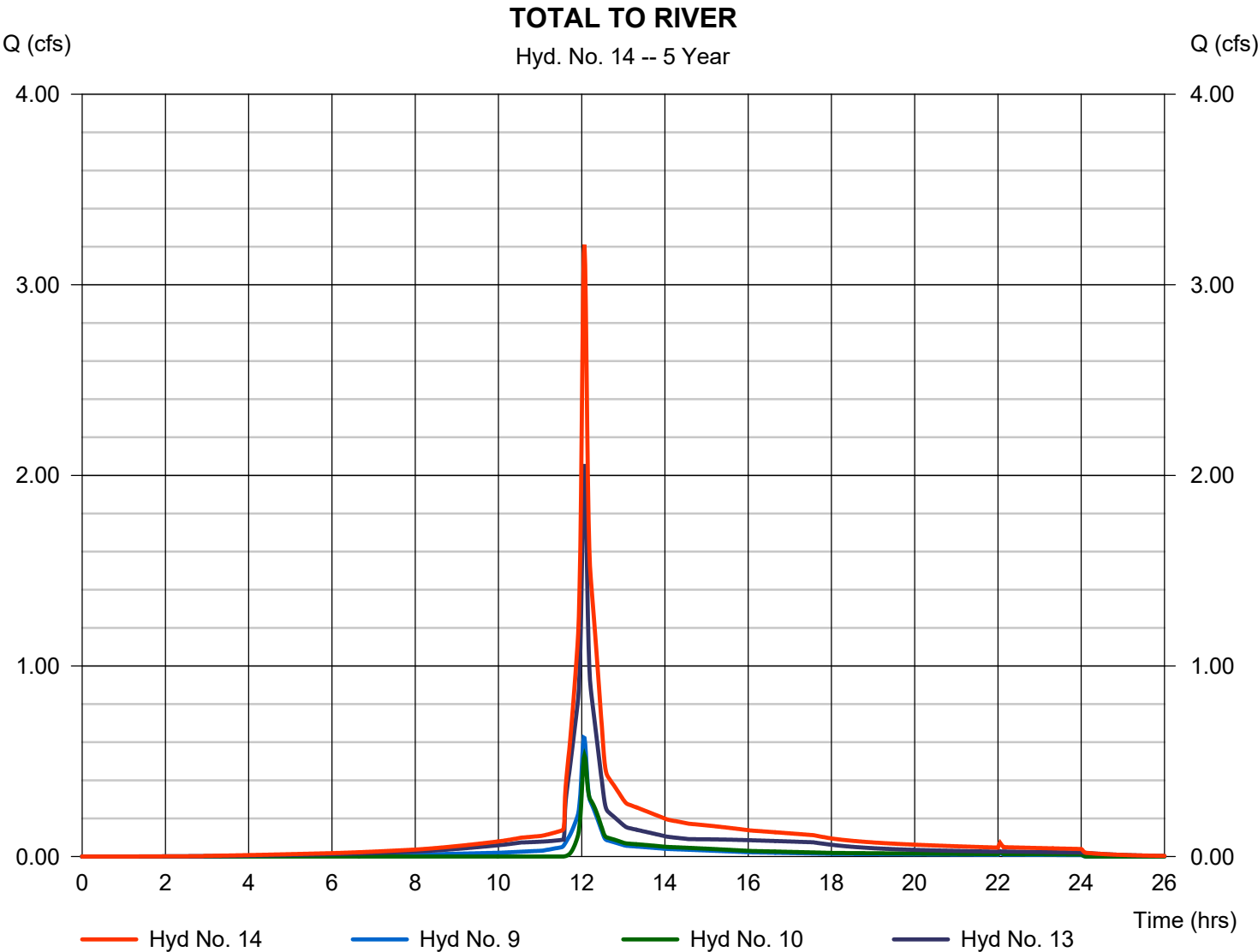
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v12

Thursday, 08 / 27 / 2020

Hyd. No. 14

TOTAL TO RIVER

Hydrograph type	= Combine	Peak discharge	= 3.211 cfs
Storm frequency	= 5 yrs	Time to peak	= 12.07 hrs
Time interval	= 1 min	Hyd. volume	= 10,559 cuft
Inflow hyds.	= 9, 10, 13	Contrib. drain. area	= 0.000 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v12

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	2.435	1	723	7,747	-----	-----	-----	TO FOREBAY
2	SCS Runoff	0.077	1	723	238	-----	-----	-----	TO BIORETENTION DIRECT
3	SCS Runoff	0.039	1	723	119	-----	-----	-----	TO END OF SWALE
4	SCS Runoff	0.313	1	724	1,014	-----	-----	-----	TO MILL BROOK WEST
5	SCS Runoff	0.535	1	723	1,762	-----	-----	-----	TO MILL BROOK WEST-OFFSITE
6	SCS Runoff	0.537	1	724	1,688	-----	-----	-----	TO MILL BROOK CENTER
7	SCS Runoff	0.129	1	723	396	-----	-----	-----	TO MILL BROOK - RESTORATION
8	SCS Runoff	0.208	1	724	676	-----	-----	-----	TO MILL BROOK EAST
9	Combine	0.839	1	723	2,776	4, 5,	-----	-----	WEST TO RIVER
10	Combine	0.866	1	724	2,761	6, 7, 8,	-----	-----	EAST TO RIVER
11	Combine	2.512	1	723	7,985	1, 2,	-----	-----	TO POND
12	Reservoir	2.472	1	724	7,981	11	64.39	657	OUT OF BR
13	Combine	2.508	1	724	8,100	3, 12	-----	-----	TO SWALE OUTLET
14	Combine	4.210	1	724	13,637	9, 10, 13	-----	-----	TOTAL TO RIVER
									242 of 342
Proposed H-H.gpw					Return Period: 10 Year			Thursday, 08 / 27 / 2020	

Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v12

Thursday, 08 / 27 / 2020

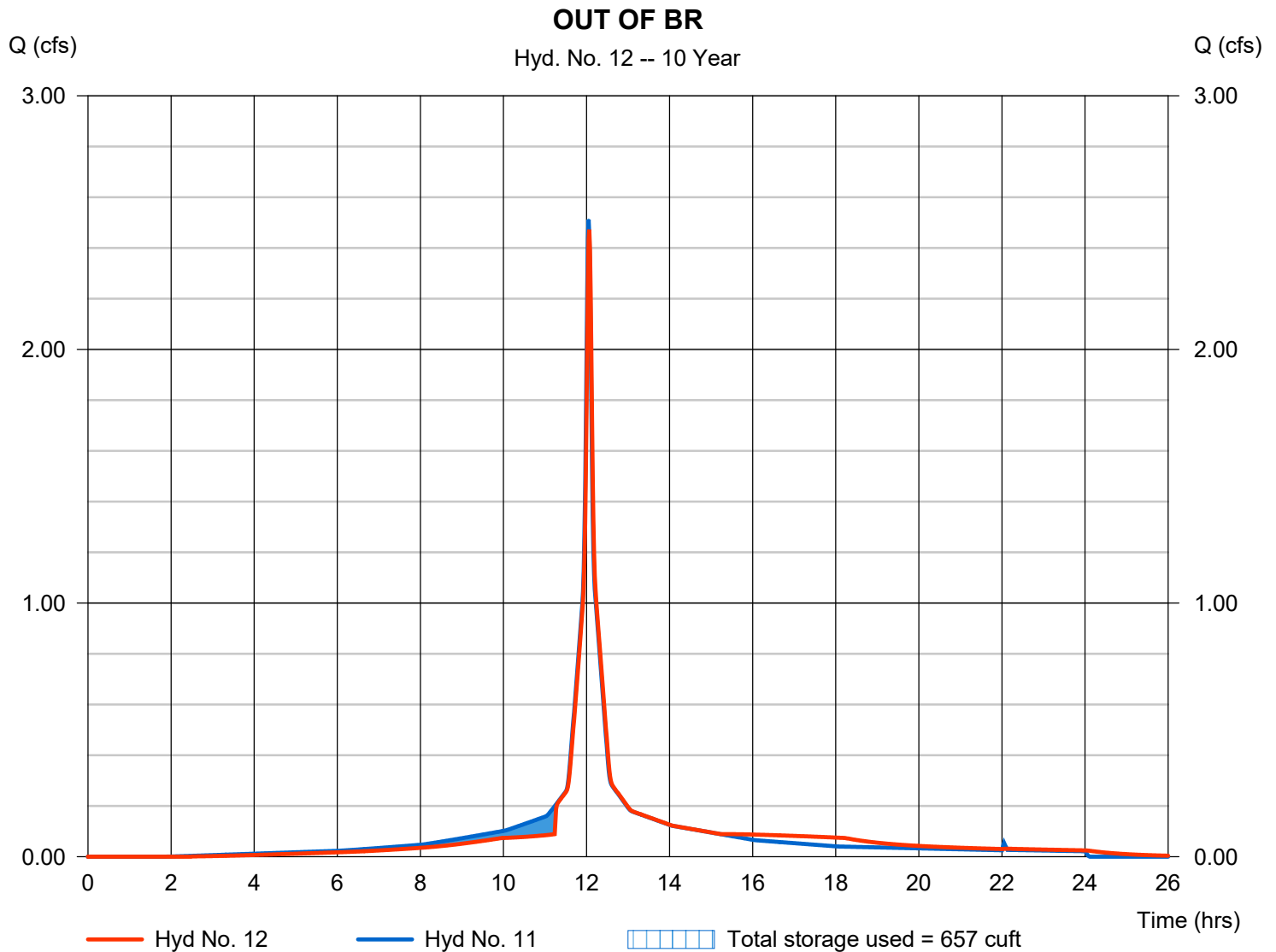
Hyd. No. 12

OUT OF BR

Hydrograph type = Reservoir
 Storm frequency = 10 yrs
 Time interval = 1 min
 Inflow hyd. No. = 11 - TO POND
 Reservoir name = BIORET

Peak discharge = 2.472 cfs
 Time to peak = 12.07 hrs
 Hyd. volume = 7,981 cuft
 Max. Elevation = 64.39 ft
 Max. Storage = 657 cuft

Storage Indication method used. Outflow includes exfiltration.



Hydrograph Report

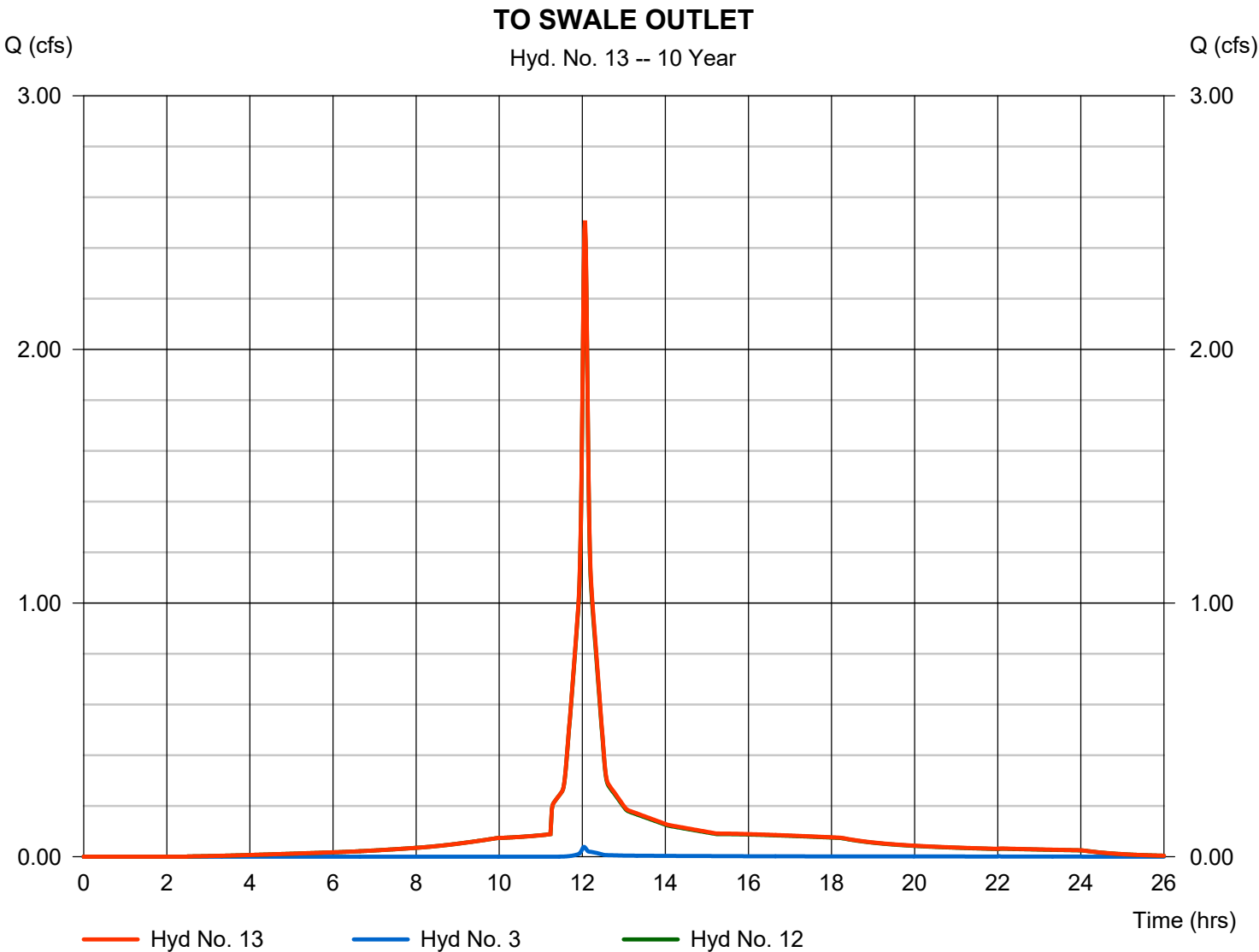
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v12

Thursday, 08 / 27 / 2020

Hyd. No. 13

TO SWALE OUTLET

Hydrograph type	= Combine	Peak discharge	= 2.508 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.07 hrs
Time interval	= 1 min	Hyd. volume	= 8,100 cuft
Inflow hyds.	= 3, 12	Contrib. drain. area	= 0.030 ac



Hydrograph Report

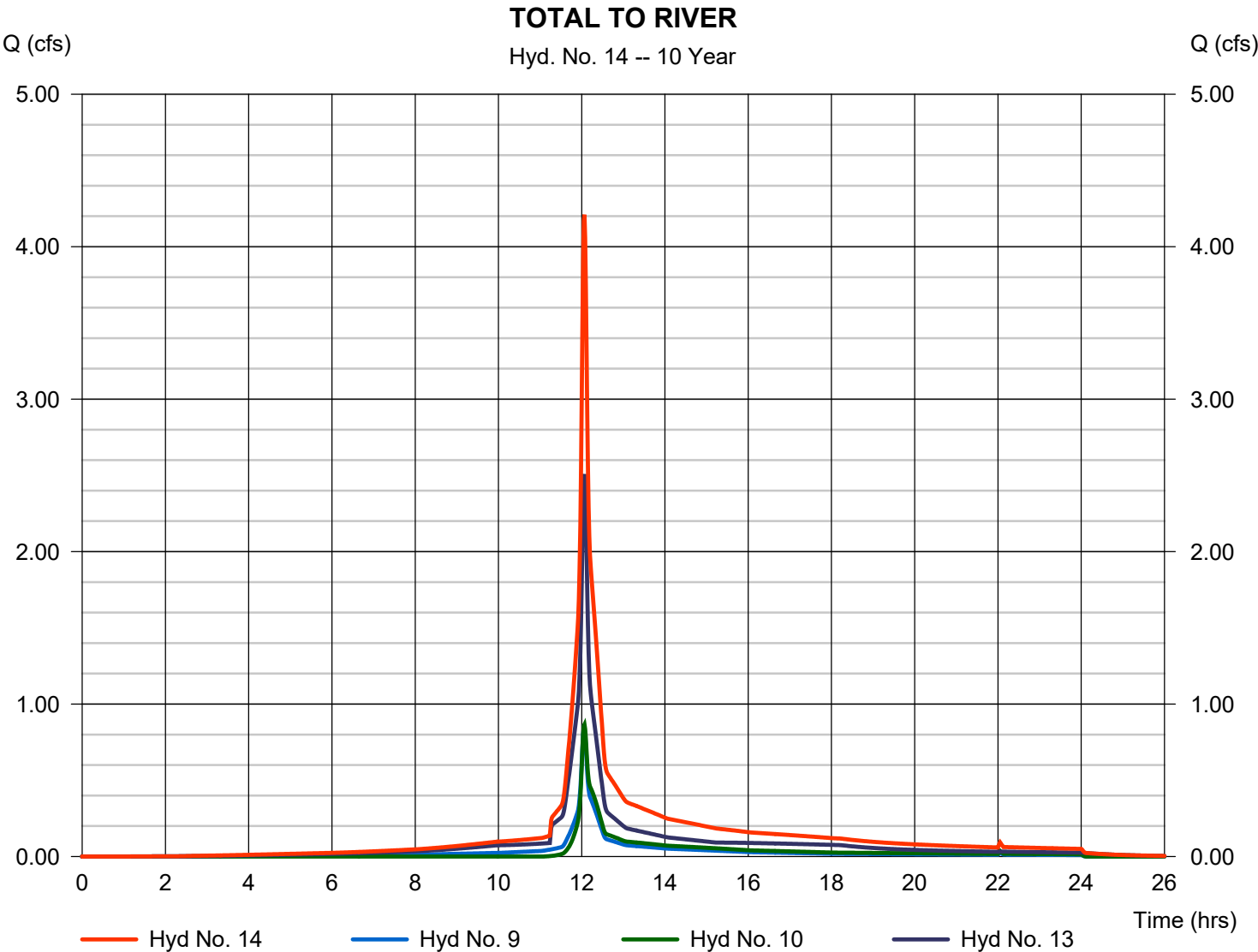
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v12

Thursday, 08 / 27 / 2020

Hyd. No. 14

TOTAL TO RIVER

Hydrograph type	= Combine	Peak discharge	= 4.210 cfs
Storm frequency	= 10 yrs	Time to peak	= 12.07 hrs
Time interval	= 1 min	Hyd. volume	= 13,637 cuft
Inflow hyds.	= 9, 10, 13	Contrib. drain. area	= 0.000 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v12

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	3.100	1	723	9,993	-----	-----	-----	TO FOREBAY
2	SCS Runoff	0.137	1	722	392	-----	-----	-----	TO BIORETENTION DIRECT
3	SCS Runoff	0.068	1	722	196	-----	-----	-----	TO END OF SWALE
4	SCS Runoff	0.551	1	724	1,672	-----	-----	-----	TO MILL BROOK WEST
5	SCS Runoff	0.677	1	723	2,249	-----	-----	-----	TO MILL BROOK WEST-OFFSITE
6	SCS Runoff	0.910	1	724	2,726	-----	-----	-----	TO MILL BROOK CENTER
7	SCS Runoff	0.228	1	722	653	-----	-----	-----	TO MILL BROOK - RESTORATION
8	SCS Runoff	0.367	1	724	1,115	-----	-----	-----	TO MILL BROOK EAST
9	Combine	1.221	1	723	3,921	4, 5,	-----	-----	WEST TO RIVER
10	Combine	1.490	1	723	4,494	6, 7, 8,	-----	-----	EAST TO RIVER
11	Combine	3.235	1	723	10,385	1, 2,	-----	-----	TO POND
12	Reservoir	3.183	1	724	10,381	11	64.43	689	OUT OF BR
13	Combine	3.245	1	724	10,577	3, 12	-----	-----	TO SWALE OUTLET
14	Combine	5.943	1	724	18,992	9, 10, 13	-----	-----	TOTAL TO RIVER
									246 of 342
Proposed H-H.gpw					Return Period: 25 Year			Thursday, 08 / 27 / 2020	

Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v12

Thursday, 08 / 27 / 2020

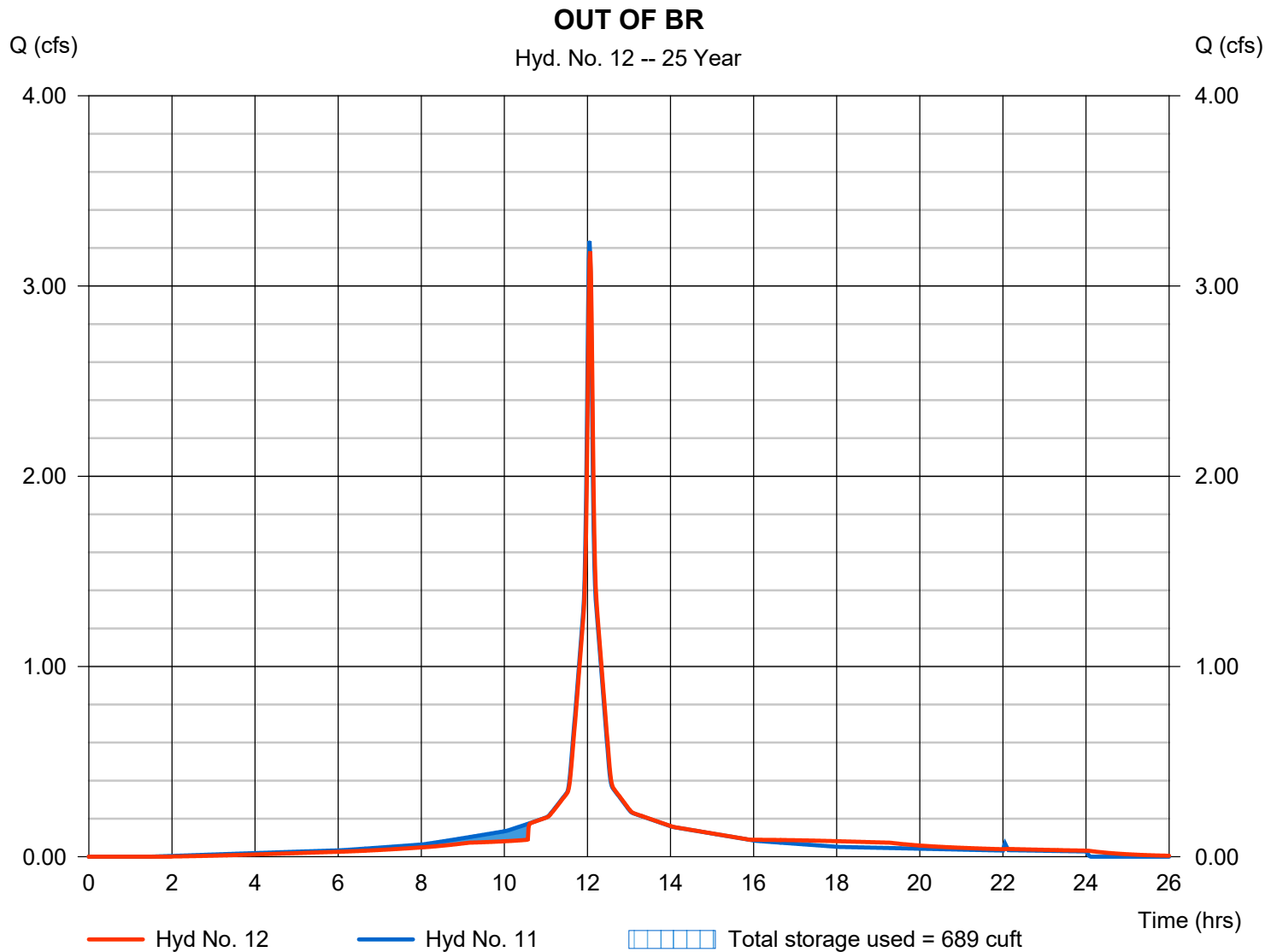
Hyd. No. 12

OUT OF BR

Hydrograph type = Reservoir
 Storm frequency = 25 yrs
 Time interval = 1 min
 Inflow hyd. No. = 11 - TO POND
 Reservoir name = BIORET

Peak discharge = 3.183 cfs
 Time to peak = 12.07 hrs
 Hyd. volume = 10,381 cuft
 Max. Elevation = 64.43 ft
 Max. Storage = 689 cuft

Storage Indication method used. Outflow includes exfiltration.



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v12

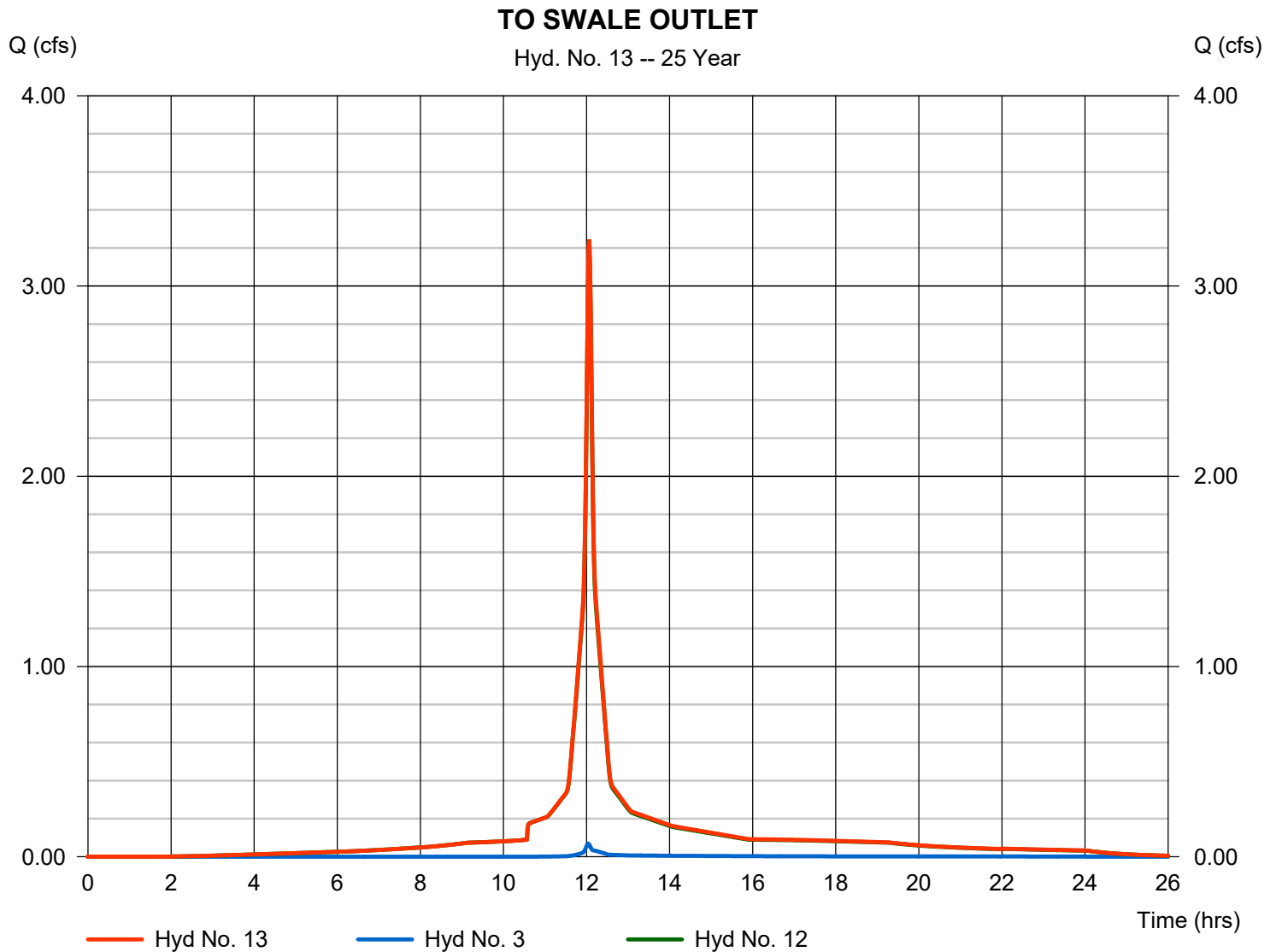
Thursday, 08 / 27 / 2020

Hyd. No. 13

TO SWALE OUTLET

Hydrograph type = Combine
 Storm frequency = 25 yrs
 Time interval = 1 min
 Inflow hyds. = 3, 12

Peak discharge = 3.245 cfs
 Time to peak = 12.07 hrs
 Hyd. volume = 10,577 cuft
 Contrib. drain. area = 0.030 ac



Hydrograph Report

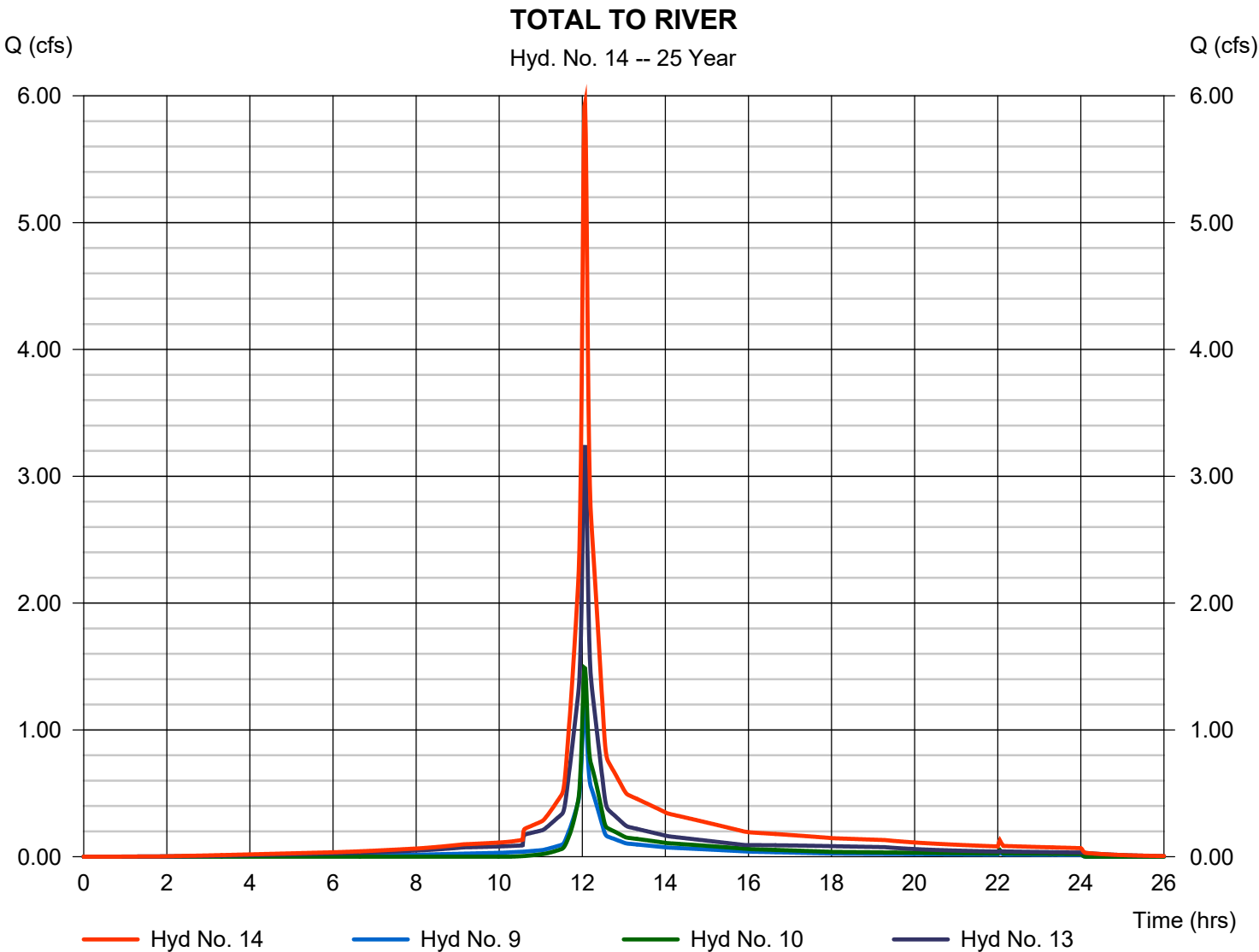
Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v12

Thursday, 08 / 27 / 2020

Hyd. No. 14

TOTAL TO RIVER

Hydrograph type	= Combine	Peak discharge	= 5.943 cfs
Storm frequency	= 25 yrs	Time to peak	= 12.07 hrs
Time interval	= 1 min	Hyd. volume	= 18,992 cuft
Inflow hyds.	= 9, 10, 13	Contrib. drain. area	= 0.000 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v12

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	3.714	1	723	12,077	-----	-----	-----	TO FOREBAY
2	SCS Runoff	0.198	1	722	552	-----	-----	-----	TO BIORETENTION DIRECT
3	SCS Runoff	0.099	1	722	276	-----	-----	-----	TO END OF SWALE
4	SCS Runoff	0.794	1	724	2,354	-----	-----	-----	TO MILL BROOK WEST
5	SCS Runoff	0.808	1	723	2,700	-----	-----	-----	TO MILL BROOK WEST-OFFSITE
6	SCS Runoff	1.288	1	724	3,791	-----	-----	-----	TO MILL BROOK CENTER
7	SCS Runoff	0.330	1	722	920	-----	-----	-----	TO MILL BROOK - RESTORATION
8	SCS Runoff	0.529	1	724	1,569	-----	-----	-----	TO MILL BROOK EAST
9	Combine	1.599	1	723	5,054	4, 5,	-----	-----	WEST TO RIVER
10	Combine	2.135	1	723	6,280	6, 7, 8,	-----	-----	EAST TO RIVER
11	Combine	3.908	1	723	12,629	1, 2,	-----	-----	TO POND
12	Reservoir	3.844	1	724	12,625	11	64.47	720	OUT OF BR
13	Combine	3.933	1	724	12,901	3, 12	-----	-----	TO SWALE OUTLET
14	Combine	7.632	1	724	24,234	9, 10, 13	-----	-----	TOTAL TO RIVER
									250 of 342
Proposed H-H.gpw					Return Period: 50 Year			Thursday, 08 / 27 / 2020	

Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v12

Thursday, 08 / 27 / 2020

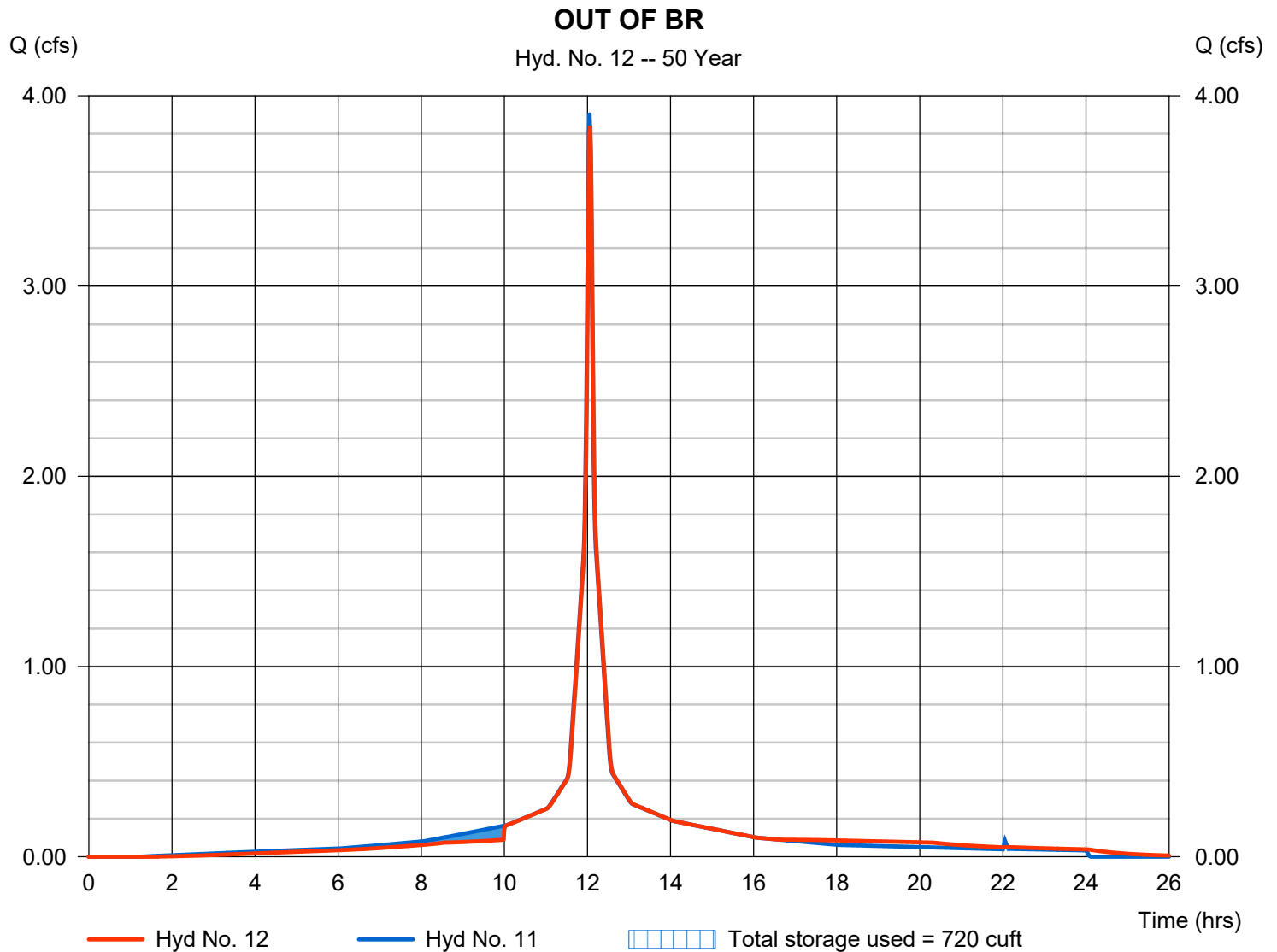
Hyd. No. 12

OUT OF BR

Hydrograph type = Reservoir
 Storm frequency = 50 yrs
 Time interval = 1 min
 Inflow hyd. No. = 11 - TO POND
 Reservoir name = BIORET

Peak discharge = 3.844 cfs
 Time to peak = 12.07 hrs
 Hyd. volume = 12,625 cuft
 Max. Elevation = 64.47 ft
 Max. Storage = 720 cuft

Storage Indication method used. Outflow includes exfiltration.



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v12

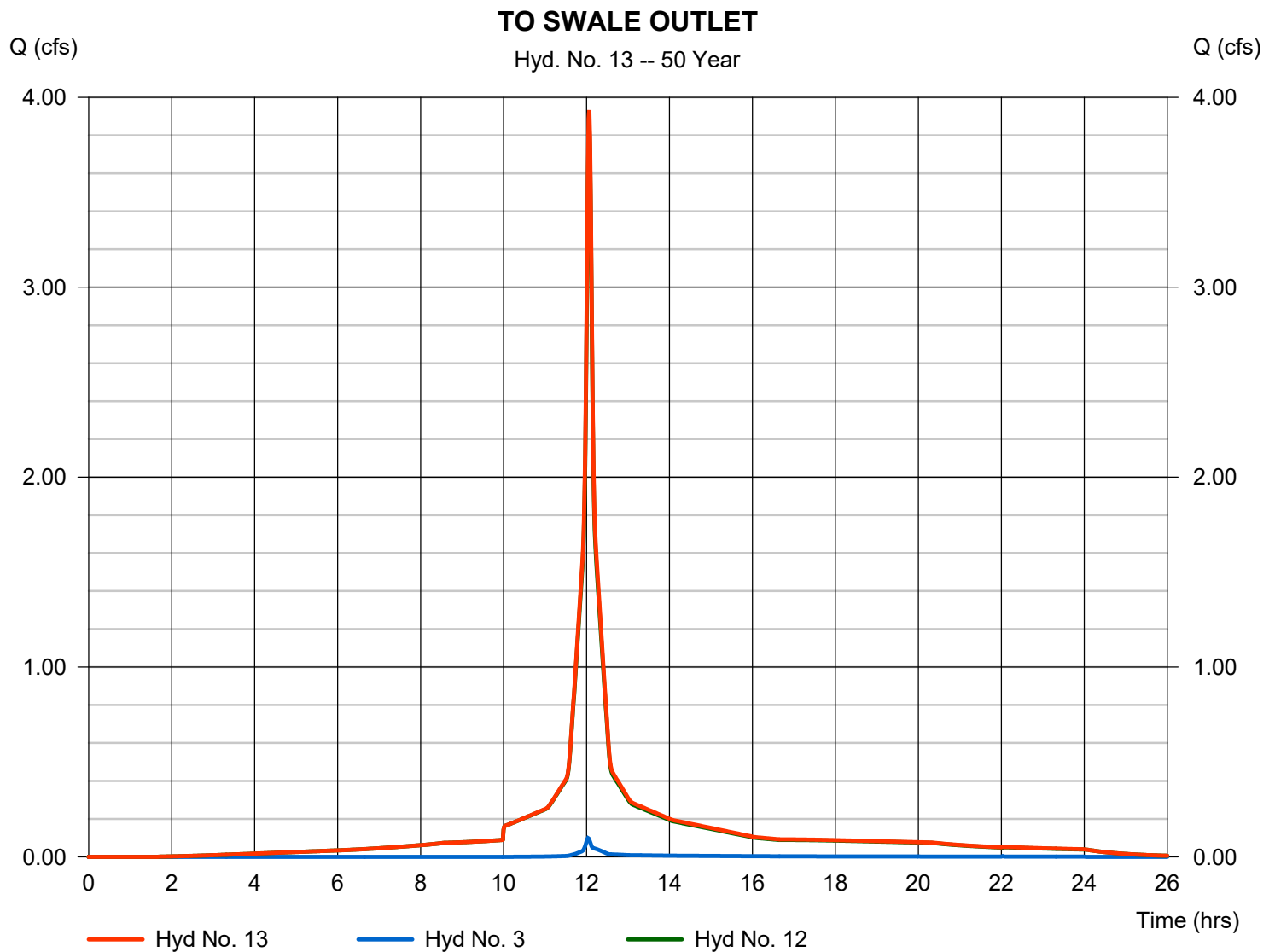
Thursday, 08 / 27 / 2020

Hyd. No. 13

TO SWALE OUTLET

Hydrograph type = Combine
Storm frequency = 50 yrs
Time interval = 1 min
Inflow hyds. = 3, 12

Peak discharge = 3.933 cfs
Time to peak = 12.07 hrs
Hyd. volume = 12,901 cuft
Contrib. drain. area = 0.030 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v12

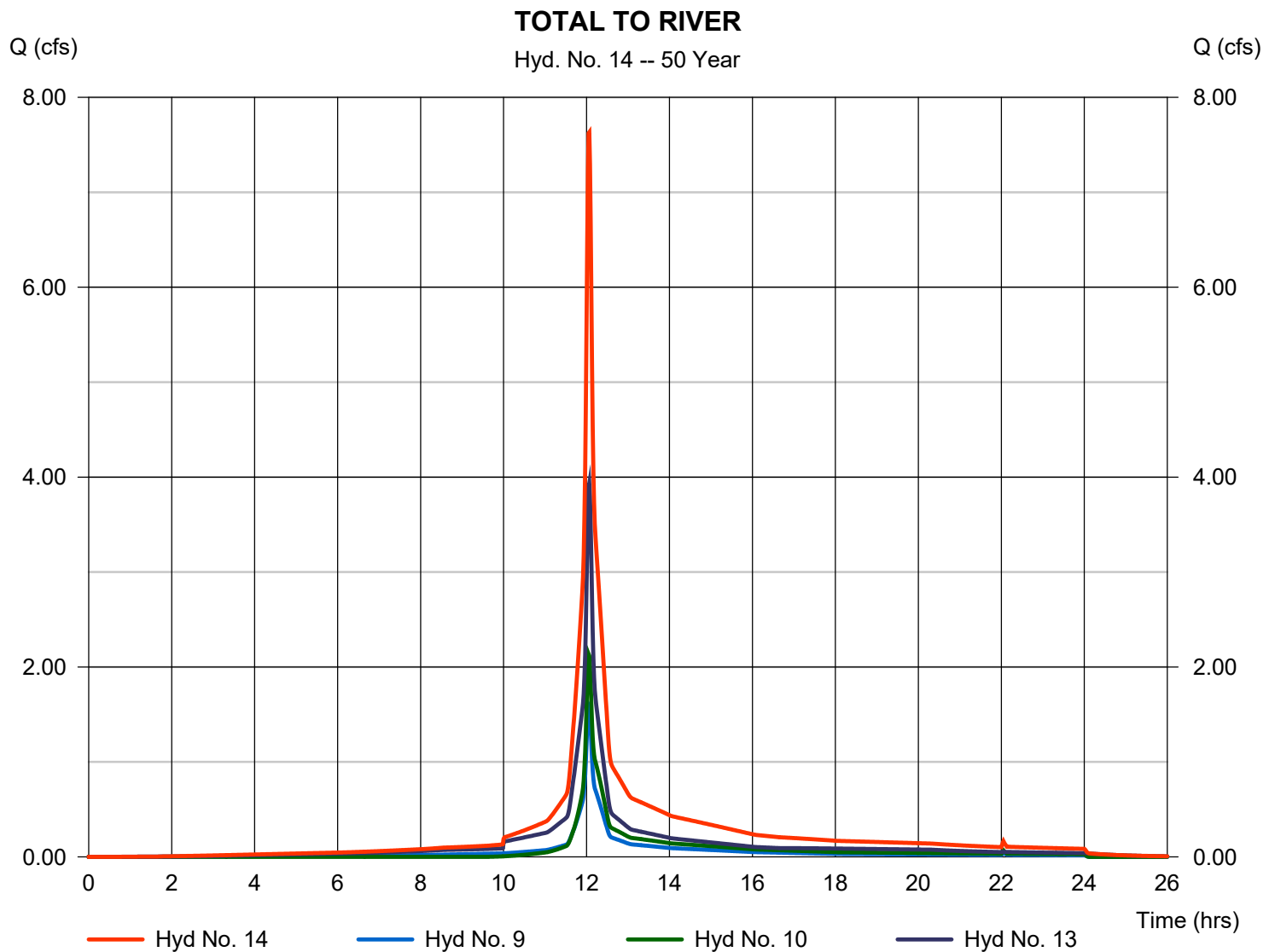
Thursday, 08 / 27 / 2020

Hyd. No. 14

TOTAL TO RIVER

Hydrograph type = Combine
 Storm frequency = 50 yrs
 Time interval = 1 min
 Inflow hyds. = 9, 10, 13

Peak discharge = 7.632 cfs
 Time to peak = 12.07 hrs
 Hyd. volume = 24,234 cuft
 Contrib. drain. area = 0.000 ac



Hydrograph Summary Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v12

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	SCS Runoff	4.450	1	723	14,588	-----	-----	-----	TO FOREBAY
2	SCS Runoff	0.277	1	722	760	-----	-----	-----	TO BIORETENTION DIRECT
3	SCS Runoff	0.139	1	722	380	-----	-----	-----	TO END OF SWALE
4	SCS Runoff	1.108	1	723	3,242	-----	-----	-----	TO MILL BROOK WEST
5	SCS Runoff	0.966	1	723	3,242	-----	-----	-----	TO MILL BROOK WEST-OFFSITE
6	SCS Runoff	1.775	1	723	5,167	-----	-----	-----	TO MILL BROOK CENTER
7	SCS Runoff	0.462	1	722	1,266	-----	-----	-----	TO MILL BROOK - RESTORATION
8	SCS Runoff	0.739	1	723	2,161	-----	-----	-----	TO MILL BROOK EAST
9	Combine	2.074	1	723	6,484	4, 5,	-----	-----	WEST TO RIVER
10	Combine	2.963	1	723	8,595	6, 7, 8,	-----	-----	EAST TO RIVER
11	Combine	4.720	1	723	15,348	1, 2,	-----	-----	TO POND
12	Reservoir	4.642	1	724	15,344	11	64.52	757	OUT OF BR
13	Combine	4.766	1	724	15,724	3, 12	-----	-----	TO SWALE OUTLET
14	Combine	9.755	1	723	30,803	9, 10, 13	-----	-----	TOTAL TO RIVER
									254 of 342
Proposed H-H.gpw					Return Period: 100 Year			Thursday, 08 / 27 / 2020	

Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v12

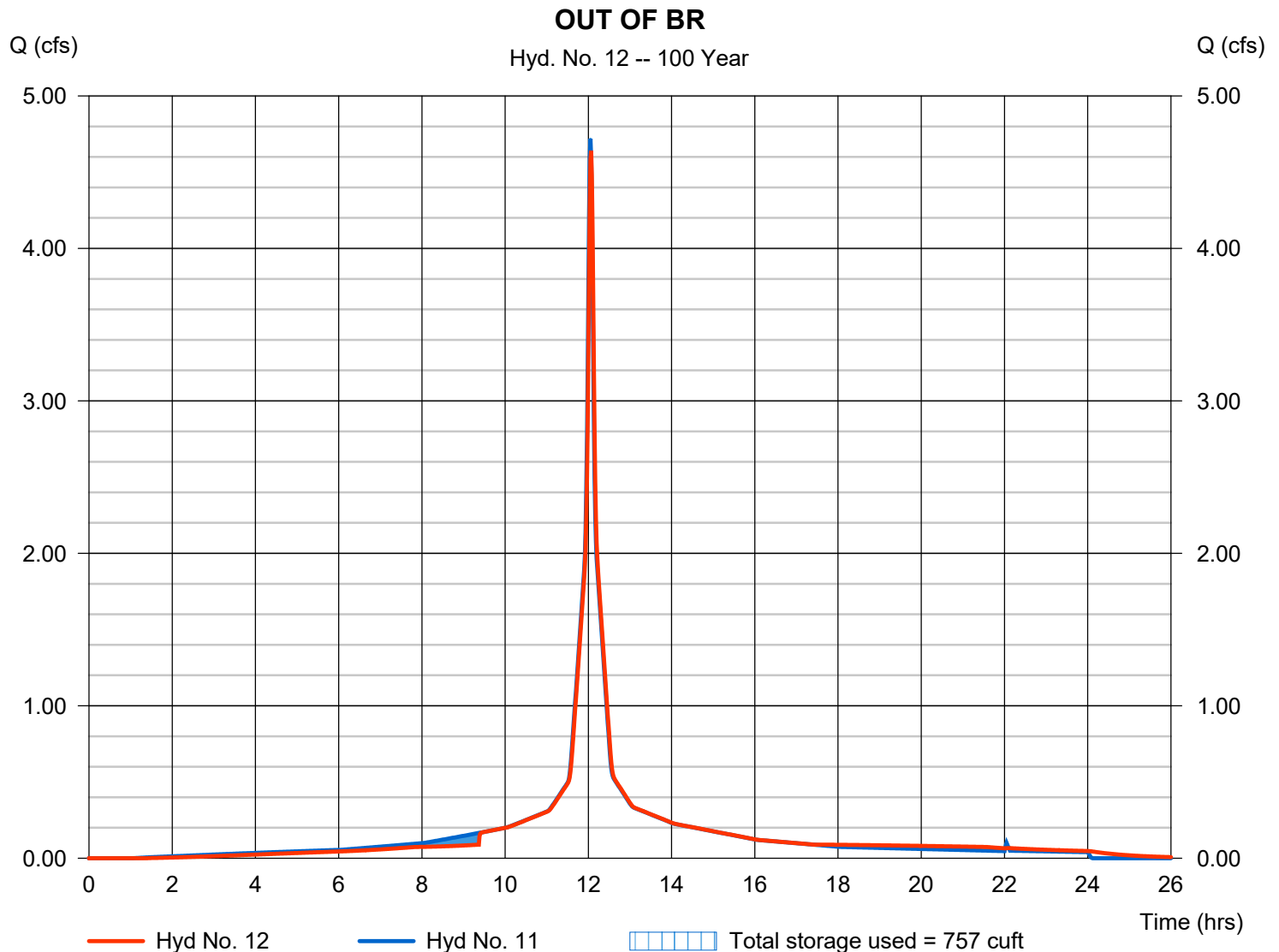
Thursday, 08 / 27 / 2020

Hyd. No. 12

OUT OF BR

Hydrograph type	= Reservoir	Peak discharge	= 4.642 cfs
Storm frequency	= 100 yrs	Time to peak	= 12.07 hrs
Time interval	= 1 min	Hyd. volume	= 15,344 cuft
Inflow hyd. No.	= 11 - TO POND	Max. Elevation	= 64.52 ft
Reservoir name	= BIORET	Max. Storage	= 757 cuft

Storage Indication method used. Outflow includes exfiltration.



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v12

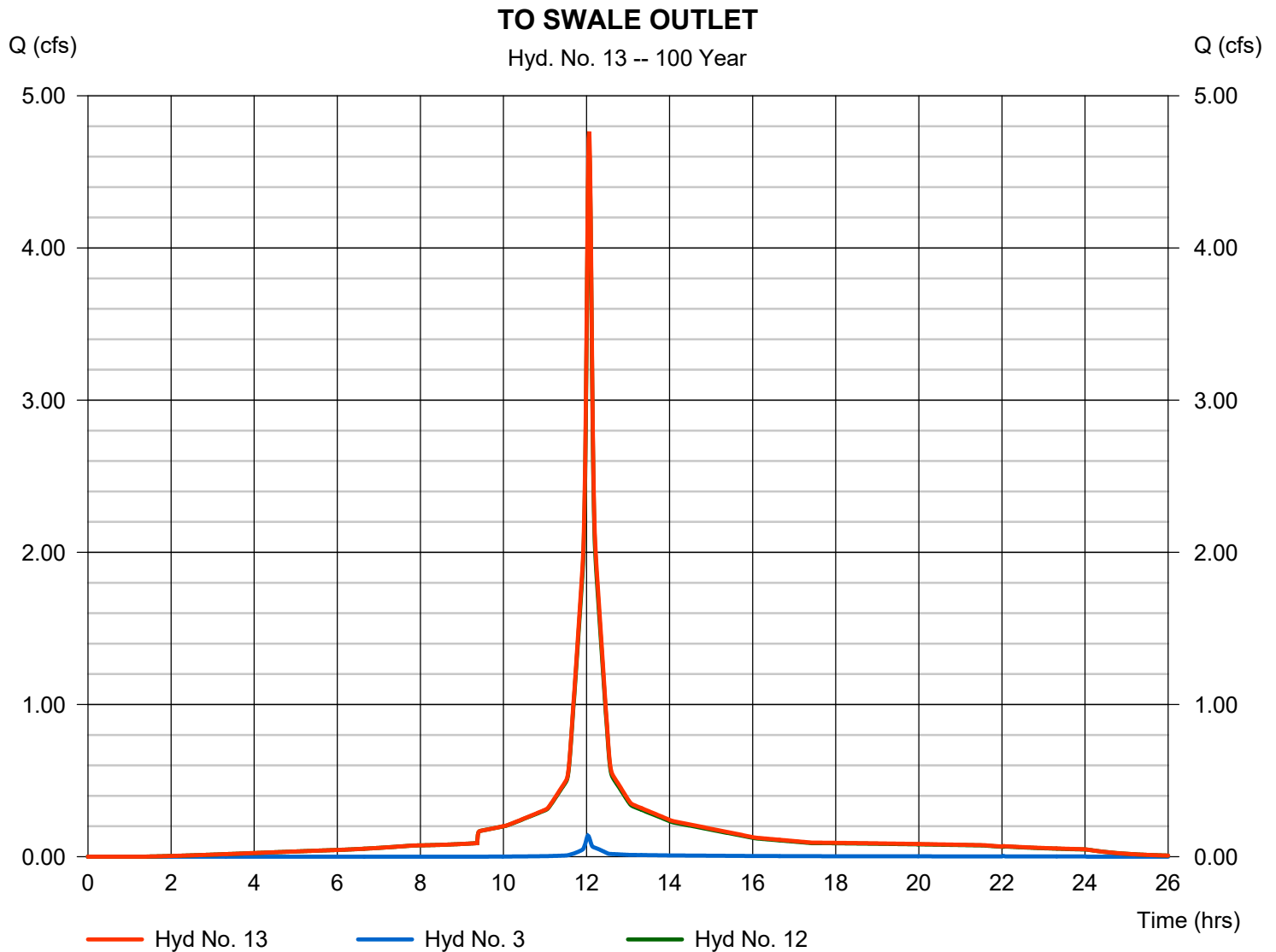
Thursday, 08 / 27 / 2020

Hyd. No. 13

TO SWALE OUTLET

Hydrograph type = Combine
 Storm frequency = 100 yrs
 Time interval = 1 min
 Inflow hyds. = 3, 12

Peak discharge = 4.766 cfs
 Time to peak = 12.07 hrs
 Hyd. volume = 15,724 cuft
 Contrib. drain. area = 0.030 ac



Hydrograph Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v12

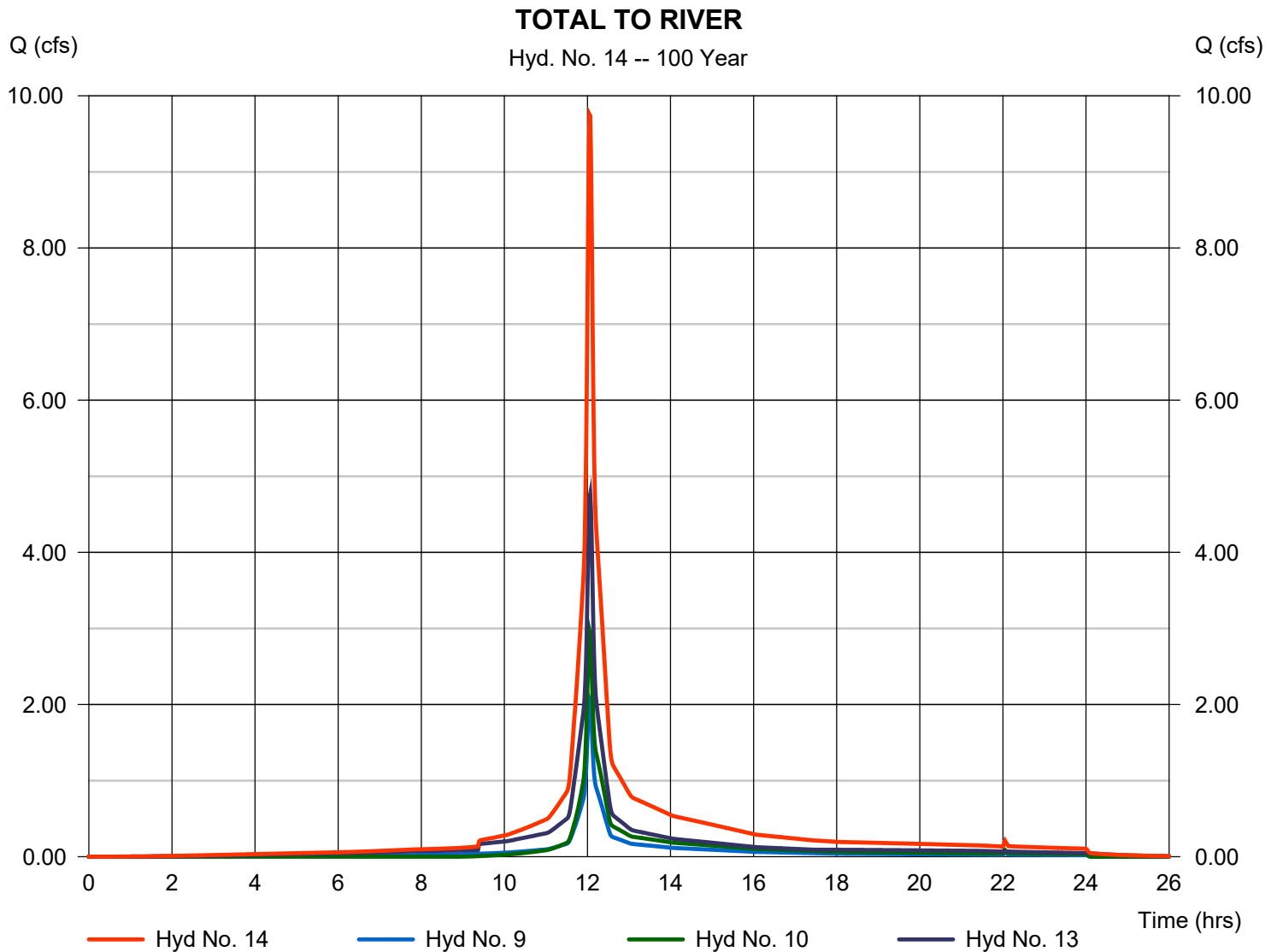
Thursday, 08 / 27 / 2020

Hyd. No. 14

TOTAL TO RIVER

Hydrograph type = Combine
Storm frequency = 100 yrs
Time interval = 1 min
Inflow hyds. = 9, 10, 13

Peak discharge = 9.755 cfs
Time to peak = 12.05 hrs
Hyd. volume = 30,803 cuft
Contrib. drain. area = 0.000 ac



Hydraflow Rainfall Report

Hydraflow Hydrographs Extension for Autodesk® Civil 3D® 2019 by Autodesk, Inc. v12

Thursday, 08 / 27 / 2020

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	-----
2	69.8703	13.1000	0.8658	-----
3	0.0000	0.0000	0.0000	-----
5	79.2597	14.6000	0.8369	-----
10	88.2351	15.5000	0.8279	-----
25	102.6072	16.5000	0.8217	-----
50	114.8193	17.2000	0.8199	-----
100	127.1596	17.8000	0.8186	-----

File name: SampleFHA.idf

$$\text{Intensity} = B / (T_c + D)^E$$

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	5.69	4.61	3.89	3.38	2.99	2.69	2.44	2.24	2.07	1.93	1.81	1.70
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	6.57	5.43	4.65	4.08	3.65	3.30	3.02	2.79	2.59	2.42	2.27	2.15
10	7.24	6.04	5.21	4.59	4.12	3.74	3.43	3.17	2.95	2.77	2.60	2.46
25	8.25	6.95	6.03	5.34	4.80	4.38	4.02	3.73	3.48	3.26	3.07	2.91
50	9.04	7.65	6.66	5.92	5.34	4.87	4.49	4.16	3.88	3.65	3.44	3.25
100	9.83	8.36	7.30	6.50	5.87	5.36	4.94	4.59	4.29	4.03	3.80	3.60

T_c = time in minutes. Values may exceed 60.

Precip. file name: Sample.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	2.58	3.09	0.00	3.90	4.65	5.87	7.00	8.36
SCS 6-Hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-1st	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Custom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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Appendix D – Soil Borings








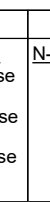

CLIENT: Town of Arlington
PROJECT NUMBER: 2180078

PROJECT NAME: Wellington Park Revitalization
PROJECT LOCATION: Arlington, MA

DRILLER: Gary Caouette - Technical Drilling Services
LOGGED / CHECKED BY: NP / RJV
RIG TYPE / DRILLING METHODS: Truck / hollow-stem auger (HSA)
CASING DIAMETER: 4.25" ID
SAMPLING METHODS: Standard penetration test (SPT)
SAMPLER TYPE: Standard 24" long x 2" OD (1-3/8" ID) split-spoon
SAMPLER HAMMER: 140-lb. automatic hammer
OTHER:
BORING LOCATION: See site plan.
GROUND ELEVATION: Not available **DATUM:**
DRILLING START DATE: 9/10/2018 **END DATE:** 9/10/2018

GROUNDWATER OBSERVATIONS

DATE	DEPTH	COMMENTS
9/10/2018	8 ft. +/-	Based on wet samples.

DEPTH (ft.) Elevation	SAMPLE INFORMATION						GRAPHIC LOG	STRATA NAME	MATERIAL DESCRIPTION (see guide below for soil classification based on constituent percentage)	COMMENTS
	TYPE - NO.	DEPTH (ft.)	REC./PEN. (in.)	SPT BLOWS/6"	SPT N-VALUE	% MOISTURE				
0									<div>Mineral Soil</div> <div>GRAVEL, SAND, SILT, CLAY: >50%</div> <div>gravelly, sandy, silty, clayey: 35-50%</div> <div>some: 20-35%</div> <div>little: 10-20%</div> <div>trace: 0-10%</div> <div>Organic Soil</div> <div>PEAT: 50-100%</div> <div>organic (soil): 15-50%</div> <div>with some organics: 5-15%</div>	
	S1	0.0	4/24	2 4 7 11	11			TOPSOIL	Medium dense, brown, organic silty SAND, some fine gravel, wood and roots; moist. [TOPSOIL]	Occasional drill rig chatter on possible cobbles below 4 feet.
	S2	2.0	7/24	4 4 4 4	8			FILL	Loose, brown, fine to coarse SAND, little fine to coarse gravel, some silt, trace debris (glass, wood), trace roots; moist. [FILL]	
5	S3	4.0	11/24	15 49 20 19	69			GRAVEL	Very dense, brown, sandy GRAVEL, little silt, occasional mottling; moist.	
	S4	6.0	12/24	12 12 15 17	27			GRAVEL	Medium dense, brown, sandy GRAVEL, little silt, trace clay; moist.	
	S5	8.0	7/24	5 10 9 11	19			SAND	Medium dense, brown, gravelly SAND, some silt, trace clay; wet.	
10								SAND		
15	S6	15.0	13/24	11 7 9 15	16			SAND	Medium dense, brown and gray, fine to coarse SAND, little fine to coarse gravel, trace silt; wet.	
20								SAND		
	S7	20.0	5/6	120				SAND	Very dense, brown and gray, fine to coarse SAND, some fine to medium gravel, trace silt; wet. Split spoon refusal at 20.5 ft. End of boring at 20.5 ft.	

SAMPLE		GRANULAR SOILS		COHESIVE SOILS		GENERAL NOTES:
SYMBOL	TYPE	N-Value	Density	N-VALUE	CONSISTENCY	
S	Split spoon	0-4	Very Loose	< 2	Very Soft	1. The stratification lines represent the approximate boundary between soil types; actual transitions may be gradual. 2. Water level readings have been made in the drill holes at the times and conditions stated on the boring log. Fluctuations in the level of groundwater may occur due to other factors than those presented at the time measurements are made.
ST	Shelby tube	4-10	Loose	2-4	Soft	
AG	Auger grab	10-30	Med. Dense	4-8	Med. Stiff	
NX	Rock core	30-50	Dense	8-15	Stiff	
GP	Direct push	> 50	Very Dense	15-30	Very Stiff	
				> 30	Hard	

CLIENT: Town of Arlington
PROJECT NUMBER: 2180078
PROJECT NAME: Wellington Park Revitalization
PROJECT LOCATION: Arlington, MA

DRILLER: Gary Caouette - Technical Drilling Services
LOGGED / CHECKED BY: NP / RJV
RIG TYPE / DRILLING METHODS: Truck / hollow-stem auger (HSA)
CASING DIAMETER: 4.25" ID
SAMPLING METHODS: Standard penetration test (SPT)
SAMPLER TYPE: Standard 24" long x 2" OD (1-3/8" ID) split-spoon
SAMPLER HAMMER: 140-lb. automatic hammer
OTHER:

BORING LOCATION: See site plan.
GROUND ELEVATION: Not available **DATUM:**
DRILLING START DATE: 9/10/2018 **END DATE:** 9/10/2018

GROUNDWATER OBSERVATIONS

DATE	DEPTH	COMMENTS
	Not observed	

DEPTH (ft.) Elevation	SAMPLE INFORMATION						GRAPHIC LOG	STRATA NAME	MATERIAL DESCRIPTION (see guide below for soil classification based on constituent percentage)	COMMENTS
	TYPE - NO.	DEPTH (ft.)	REC./PEN. (in.)	SPT BLOWS/6"	SPT N-VALUE	% MOISTURE				
0									Mineral Soil GRAVEL, SAND, SILT, CLAY: >50% gravelly, sandy, silty, clayey: 35-50% some: 20-35% little: 10-20% trace: 0-10%	
	S1	0.0	11/24	3 5 7 5	12			TOPSOIL	Medium dense, brown, organic silty SAND, little gravel, with fine roots; moist. [TOPSOIL]	
	S2	2.0	4/24	2 5 14 12	19			SAND	Medium dense, brown and gray, fine to coarse SAND, little gravel, little silt, with trace organics and occasional fine roots; moist.	
5	S3	4.0	11/24	8 5 5 3	10			SAND	Medium dense, brown, gravelly fine to coarse SAND, trace silt, mottling present, with occasional fine roots; moist.	Occasional drill rig chatter on possible cobbles below 4 feet.
	S4	6.0	12/24	18 14 18 25	32			GRAVEL	Dense, brown and gray, sandy fine to coarse GRAVEL, little silt, trace clay, mottling present, with occasional fine roots; moist.	
10										

Auger refusal on possible boulder at 10 ft.
 End of boring at 10 ft.

SAMPLE		GRANULAR SOILS		COHESIVE SOILS		GENERAL NOTES:
SYMBOL	TYPE	N-Value	Density	N-VALUE	CONSISTENCY	
S	Split spoon	0-4	Very Loose	< 2	Very Soft	1. The stratification lines represent the approximate boundary between soil types; actual transitions may be gradual. 2. Water level readings have been made in the drill holes at the times and conditions stated on the boring log. Fluctuations in the level of groundwater may occur due to other factors than those presented at the time measurements are made.
ST	Shelby tube	4-10	Loose	2-4	Soft	
AG	Auger grab	10-30	Med. Dense	4-8	Med. Stiff	
NX	Rock core	30-50	Dense	8-15	Stiff	
GP	Direct push	> 50	Very Dense	15-30 > 30	Very Stiff Hard	

CLIENT: Town of Arlington
PROJECT NUMBER: 2180078



PROJECT NAME: Wellington Park Revitalization
PROJECT LOCATION: Arlington, MA

DRILLER: Gary Caouette - Technical Drilling Services
LOGGED / CHECKED BY: NP / RJV
RIG TYPE / DRILLING METHODS: Truck / hollow-stem auger (HSA)
CASING DIAMETER: 4.25" ID
SAMPLING METHODS: Standard penetration test (SPT)
SAMPLER TYPE: Standard 24" long x 2" OD (1-3/8" ID) split-spoon
SAMPLER HAMMER: 140-lb. automatic hammer
OTHER: Grounwater monitoring well installed following completion.

BORING LOCATION: See site plan.
GROUND ELEVATION: Not available **DATUM:**
DRILLING START DATE: 9/10/2018 **END DATE:** 9/10/2018

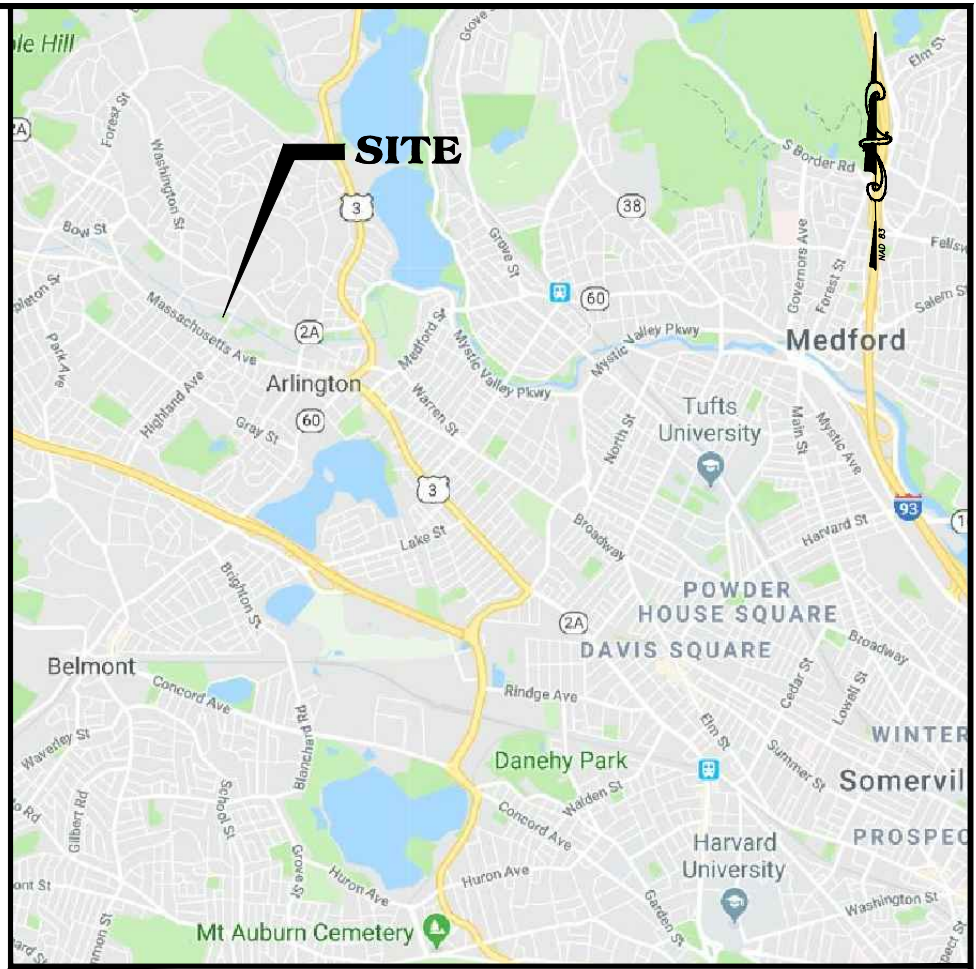
GROUNDWATER OBSERVATIONS

DATE	DEPTH	COMMENTS
9/10/2018	12.5 ft. +/-	Approximate depth based on wet samples.

DEPTH (ft.) Elevation	SAMPLE INFORMATION						GRAPHIC LOG	STRATA NAME	MATERIAL DESCRIPTION (see guide below for soil classification based on constituent percentage)	COMMENTS
	TYPE - NO.	DEPTH (ft.)	REC./PEN. (in.)	SPT BLOWS/6"	SPT N-VALUE	% MOISTURE				
0									<div>Mineral Soil</div> <div>GRAVEL, SAND, SILT, CLAY: >50%</div> <div>gravelly, sandy, silty, clayey: 35-50%</div> <div>some: 20-35%</div> <div>little: 10-20%</div> <div>trace: 0-10%</div> <div>Organic Soil</div> <div>PEAT: 50-100%</div> <div>organic (soil): 15-50%</div> <div>with some organics: 5-15%</div>	
5	S1	0.0	11/24	5 7 7	14			TOPSOIL	Medium dense, brown, organic silty SAND, little gravel, trace fine roots; moist. [TOPSOIL]	Occasional drill rig chatter on possible cobbles below 4 feet.
	S2	2.0	10/24	6 7 7 20	14				Medium dense, brown, fine to medium SAND, some silt, little gravel, trace clay, with trace fine roots; moist.	
	S3	4.0	11/24	63 43 28 30	71				Very dense, pale brown, gravelly fine to coarse SAND, little silt, trace clay; moist.	
	S4	6.0	18/24	35 33 57 33	90				Very dense, pale brown, gravelly fine to coarse SAND, little silt, trace clay; moist.	
	S5	8.0	15/24	24 24 29 33	53				Very dense, pale brown, gravelly fine to coarse SAND, little silt, trace clay; moist.	
10										
15									Assumed lithology change	
20	S6	15.0	17/24	28 21 32 33	53				Very dense, brown, sandy fine to coarse GRAVEL, little silt; wet.	
	S7	20.0	/24	25 25 29 31	54				Very dense, brown, sandy GRAVEL, little silt; wet.	

End of Boring at 22 feet. Groundwater monitoring well installed to 20 feet following completion.

SAMPLE		GRANULAR SOILS		COHESIVE SOILS		GENERAL NOTES:
SYMBOL	TYPE	N-Value	Density	N-VALUE	CONSISTENCY	
S	Split spoon	0-4	Very Loose	< 2	Very Soft	1. The stratification lines represent the approximate boundary between soil types; actual transitions may be gradual. 2. Water level readings have been made in the drill holes at the times and conditions stated on the boring log. Fluctuations in the level of groundwater may occur due to other factors than those presented at the time measurements are made.
ST	Shelby tube	4-10	Loose	2-4	Soft	
AG	Auger grab	10-30	Med. Dense	4-8	Med. Stiff	
NX	Rock core	30-50	Dense	8-15	Stiff	
GP	Direct push	> 50	Very Dense	15-30	Very Stiff	
				> 30	Hard	



Appendix E – Site Photographs



Photograph 1: Looking back towards the main park entrance adjacent to the tennis courts, this is the proposed location for the naturalistic exploration and seating area.



Photograph 2: Far end of the existing boardwalk (constructed as part of the previous phase) with no accessible transition to adjacent surface.



Photograph 3: Low area at the base of Prentiss Road, which acts as an entry point for stormwater runoff into the park.



Photograph 4: Overgrown area that runs behind the Prentiss Road properties toward the pedestrian footbridge.



Photograph 5: Steeply sloped compacted earth pathway towards the pedestrian bridge between Prentiss Road and the flood storage area, constructed as part of the previous phase.



Photograph 6: Existing pressure-treated footbridge over Mill Brook towards Dudley Street.

Appendix F – Operation and Maintenance Plan



MEMO

Date: 9/2/2020

To: Arlington Park and Recreation Commission

From: Andrew Keel
Hatch Associates Consultants, Inc.
27 Congress Street, Suite 508
Salem, MA 01970
978-224-3110

Re: **Wellington Park and Mill Brook Corridor Revitalization Project – Phase 3
Operations and Maintenance Plan**

Attachments: - Biobasin and Swale - Field Inspection Checklist
- Porous Paving - Field Inspection Checklist
- Operations and Maintenance Areas Diagram

General Information

1. Stormwater management system owner: Town of Arlington Park and Recreation Commission and Department and Public Works
2. Parties responsible for O&M: Town of Arlington Park and Recreation Commission and Department and Public Works. The Contractor is responsible for operations and maintenance of the system during construction.
3. The stormwater management system will be inspected and cleaned prior to the completion of construction by the Contractor. A report of the inspection/cleaning will be forwarded to the design engineer and the Town of Arlington Conservation Commission. All material removed during the cleaning operations shall be disposed of in accordance with applicable guidelines and regulations.
4. The stormwater management system shall be inspected the first year of operation after large rainfall events (all storms greater than 1-inch in 24-hour period) to verify functionality.
5. All post construction maintenance activities will be documented and kept on file and made available to the Arlington Conservation Commission upon request.
6. The drainage system shall be maintained. The repair of any component of the system shall be made as soon as possible to prevent any potential pollutants (including silt) from entering the resource areas or drainage system.



Stormwater components: (at the base of Prentiss Road)

1. Bioretention Basin (Biobasin)

- Bioretention Basin and Vegetated Swale designed to slow and treat stormwater runoff coming into park from Prentiss Street.
- The system is designed to infiltrate stormwater with no underdrain.
- Phase 2 boring results show well-draining soils for infiltration.
- 6" ponding depth and is designed to drain in less than 48 hours maximum.
- The basin floor is 18" layer of engineered soil, designed to control the rate of infiltration.
- Beneath engineered soil is a layer of crushed stone to improve infiltration capacity.
- The Biobasin vegetation will be limited to 7 species to facilitate ease of weed/invasives control and have similar appearance to the Spy Pond Bioretention Basin.

2. Vegetated Swale

- The Vegetated Swale is a broad, shallow channel designed to slow runoff, promote infiltration of stormwater, and filter pollutants/sediments while conveying runoff to Mill Brook.
- The Vegetated Swale is approximately six feet (6') wide with a two foot (2') wide channel bottom.
- Side slopes are graded at a 3:1 slope and the swale depth is twelve inches (12").
- The Vegetated Swale will be planted on the side slides with a stone bottom to promote conveyance/infiltration.

Construction of the System

Sediment and erosion control during construction will prevent possible damage to the drainage systems. The following guidelines shall be adhered to during construction.

1. Keep land disturbance to a minimum. Plan the phases of development so that only the areas actively being developed are exposed. All other areas should have natural vegetation preserved, have good temporary cover, or permanent vegetation established.
2. Stabilize disturbed areas. Permanent structures, temporary or permanent vegetation, and mulch should be employed as quickly as possible after land is disturbed.
3. Protect disturbed areas from stormwater runoff. Install erosion control or stormwater management measures to prevent water from entering and running over disturbed areas, and to prevent erosion damage to downstream facilities.
4. Install perimeter control practices. Use practices that isolate the development site from surrounding areas. Straw wattles shall be utilized.

Maintenance



**TABLE 1: STORMWATER GREEN INFRASTRUCTURE BEST MANAGEMENT PRACTICE (BMP)
MAINTENANCE DURING CONSTRUCTION**

Sediment Control	Inspection	Maintenance Thresholds	Maintenance Action
Erosion control straw wattles	Weekly and after large storm events (more than 1-inch of rainfall in 24-hr period).	When accumulated sediment reaches ½ the height of wattle; If integrity of system is compromised.	Remove and dispose of accumulated sediment; Restore the integrity of the system
Adjacent Roadways	Throughout construction.	Any sediment or debris deposited on roadways.	Remove/clean sediment or debris deposited on the roadway due to construction activities
Grassed Swale	Weekly and after large storm events (>than 1-inch of rainfall in 24-hr)	Flow to grassed swale shall be diverted until vegetation is stabilized.	Remove / dispose of accumulated sediment; restore if needed
Bioretention Basin	Weekly and after large storm events (>than 1-inch of rainfall in 24-hr)	Flow to grassed swale shall be diverted until vegetation is stabilized.	Remove and dispose of any accumulated sediment at diversion; restore if needed

GI BMP	Maintenance Activity	Frequency	Responsible Party
Grassed Swale	Inspect swale and repair areas of erosion and revegetate	As needed, but no less than annually	Parks and Recreation
	Mow	As necessary. Grass not to exceed 6 inch height	Parks and Recreation
	Remove sediment and debris manually	Monthly/as needed	DPW
Bioretention Basin	Remove sediment, trash and debris from forebay, basin floor, inlets, and outlets; remove weeds and invasive species by hand (growing season only).	Monthly	Vegetation Management – Parks and Recreation; Volunteer groups
	Inspect check dams and trench drain; remove leaves, debris, trash and sediment.	Annually	
	Apply two inch (2”) layer of clean hardwood mulch.	Every 3 to 5 years	
Porous Bituminous Concrete	Remove foliage / debris	As needed, but no less than every 6 months	Parks and Recreation
	Vacuum Cleaning	Every 6 months	DPW

Maintenance Budget

Maintenance costs would be included in DPW or Parks and Recreation Departments operating budget plantings and invasive removal upkeep maintained by volunteer groups.

Other Maintenance Requirements and Responsibility

1. Porous Asphalt (see attached checklist); assume Arlington DPW responsibility.
2. Boardwalk - Replace boards/railings periodically, as needed; assume Parks and Recreation Responsibility.
3. Woodland Areas – New Plantings:
 - a. Do not cut or mow.
 - b. Manually remove invasive species, twice per growing season; assume Parks and Recreation and/or Wellington Park friend's group.
4. Meadow and Tall Turf Areas (assume Parks and Recreation responsibility):
 - a. Cut annually in the spring to height no lower than six inches (6").
 - b. Tall Turf lawn areas (pathway shoulders): Mow tall turf seasonally as need to 2.5-3" minimum height.
5. Naturalistic Exploration Area:
 - a. Mowing of micro-clover lawn area and other turf areas, as needed; assume Parks and Recreation.

Wellington Park Field Inspection Checklist

Bioretention Basin and Vegetated Swale

Date of Inspection: _____ **Location:** _____ **Inspector:** _____

Task	Frequency				Comments
	1M	3M	6M	12M	
Inspect Bioretention Basin for sediment and debris			X		<input type="checkbox"/> Remove any accumulated sediment, debris, or trash. <input type="checkbox"/> Stabilize/repair any eroded areas, bare spots and slopes/banks where appropriate. <input type="checkbox"/> Properly dispose of all materials offsite. <input type="checkbox"/> Ensure checkdams are free of obstructions and debris.
Inspect Growing Medium (Planting Soils)				X	<input type="checkbox"/> In compacted areas or where ponding has occurred, remove top few inches of discolored material. Rake, till or amend with Town-approved Biobasin soil mix. <input type="checkbox"/> Remove sediment as necessary. If sediment removal results in 2" or more of soil has been removed then replace with Town-approved Biobasin soil mix.
Weed (including invasives), Dead or Dying Vegetation			X		<input type="checkbox"/> Manually remove weeds and dead/dying vegetation. <input type="checkbox"/> Basins should not appear overgrown. <input type="checkbox"/> Plantings have distinct edges confined to planting areas. <input type="checkbox"/> Properly dispose of all materials offsite.
Replace Vegetation				AN	<input type="checkbox"/> Replace dead plants (re-plant per original planting plan). <input type="checkbox"/> Stabilize any eroded areas, bare spots and slopes/banks with additional approved plantings where appropriate. <input type="checkbox"/> Do not apply fertilizers, herbicides or pesticides. <input type="checkbox"/> Re-seed the Vegetated Swale as necessary.
Maintain Tall Turf Grasses	X			X	<input type="checkbox"/> Tall Turf Lawn areas shall be kept mowed with enough frequency to keep a maintained appearance throughout the growing season. <input type="checkbox"/> Vegetated Swale should be mowed as necessary to ensure grass length does not exceed six (6) inches and two inch (2") minimum depth. <input type="checkbox"/> Manually cut perennial grasses and wildflowers within the Biobasin and Grassland (Meadow) in early Spring as directed in Report. <input type="checkbox"/> Properly dispose of all materials offsite.

Vector Controls (Wildlife)				X	<input type="checkbox"/> Biobasin shall not harbor mosquito larvae or rats that pose a threat to public health or facility structure. <input type="checkbox"/> Note holes/burrows in and around Biobasin. <input type="checkbox"/> Record the time/date, weather and site conditions when vector activity is observed. <input type="checkbox"/> Check for and note animal holes/burrows and any system short circuiting. Repair burrows when they occur, fill in and lightly compact holes with Town-approved biobasin soil mix.
Inspect Vegetated Swale				X	<input type="checkbox"/> Ensure vegetation is adequate. Replace as necessary. <input type="checkbox"/> Look for signs of rilling/gullyng. Repair any rills or gullies.
Inspect for Hardpan at Bottom of Biobasin				X	<input type="checkbox"/> Hardpan occurs when the coil becomes cemented, forming an impervious layer. Where this has occurred, scarify the soil to a depth of four to six inches (4"-6").

Inspection Notes and Additional Requirements:

- Complete inspections as noted and after a major storm event (rainfall totals greater than 0.5 inches in 24 hours).
- All facilities should drain within 48 hours, if ponding is observed after two (2) days notify Arlington Parks and Recreation.
- Maintain an annual inspection and maintenance log (including this form) with a summary of completed remediation efforts (ie. Date, contractor (if applicable,) replacement plant material, invasive plants removed, structural repairs and landscape maintenance activities.
- Record photos (from consistent locations) should be taken of each facility during each inspection.
- During first three (3) years of establishment, arrange for water with Arlington Parks and Recreation as required during extended periods without rainfall.
- Contact Arlington Parks and Recreation for immediate assistance responding to any spills.
 - Record the time/date, weather, and site conditions if site activities contaminate stormwater.
 - Record the time/date and description of corrective action taken.

Wellington Park Field Inspection Checklist

Porous Bituminous Concrete Paving

Date of Inspection: _____ **Location:** _____ **Inspector:** _____

Task	Frequency				Comments
	1M	3M	6M	12M	
Inspect Porous Paving surface for damaged areas and imperfections				X	<input type="checkbox"/> Check for damaged areas each spring. <input type="checkbox"/> Repair damaged areas with porous material approved by the Arlington Department of Public Works (DPW).
Foliage Debris Removal			X		<input type="checkbox"/> Inspect paved surface for buildup of foliage debris such as leaves, grass clippings, or other vegetation; spring and late fall, use Blower to clear the paved surface of debris.
Vacuum Cleaning and Foliage Debris Removal			X		<input type="checkbox"/> Vacuum with regenerative air sweeper at least (2) times per year. Recommended cleaning times include spring cleanup after snow melt and fall cleanup to remove organic material.
Shoulder Maintenance				X	<input type="checkbox"/> Planted and seeded areas adjacent to pavement should be adequately maintained to prevent soil washout onto pavement surface. <input type="checkbox"/> Should washout occur, soil and debris should immediately be cleaned off the pavement to prevent clogging of the material voids. <input type="checkbox"/> If erosion is observed, the affected area should be replanted or stabilized.
Snow Removal				AN	<input type="checkbox"/> Porous surface can handle small snow accumulations but will not drain effectively if more than two inches (2") of compacted snow/ice form on top. <input type="checkbox"/> Snow plowing for significant snow accumulation should be done carefully. <input type="checkbox"/> Under NO circumstance should the surface be treated with sand.

Key: 1M = monthly; 3M = every three months; 6M = every six months; 12M = every twelve months; AN = As Needed

Clogged Pavement			X		<input type="checkbox"/> Use copious amounts of water applied at low pressure to wash out loose fines through the pores. <input type="checkbox"/> If loose fines persist after application of water at low pressure, a regenerative air sweeper may be used to dislodge material from the surface. <input type="checkbox"/> Should the porous pavement become completely clogged, power washing can be used to clean the clogged areas (pressure not more than 500 psi at an angle of 30 degrees or less should be used).
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Inspection Notes and Additional Requirements:

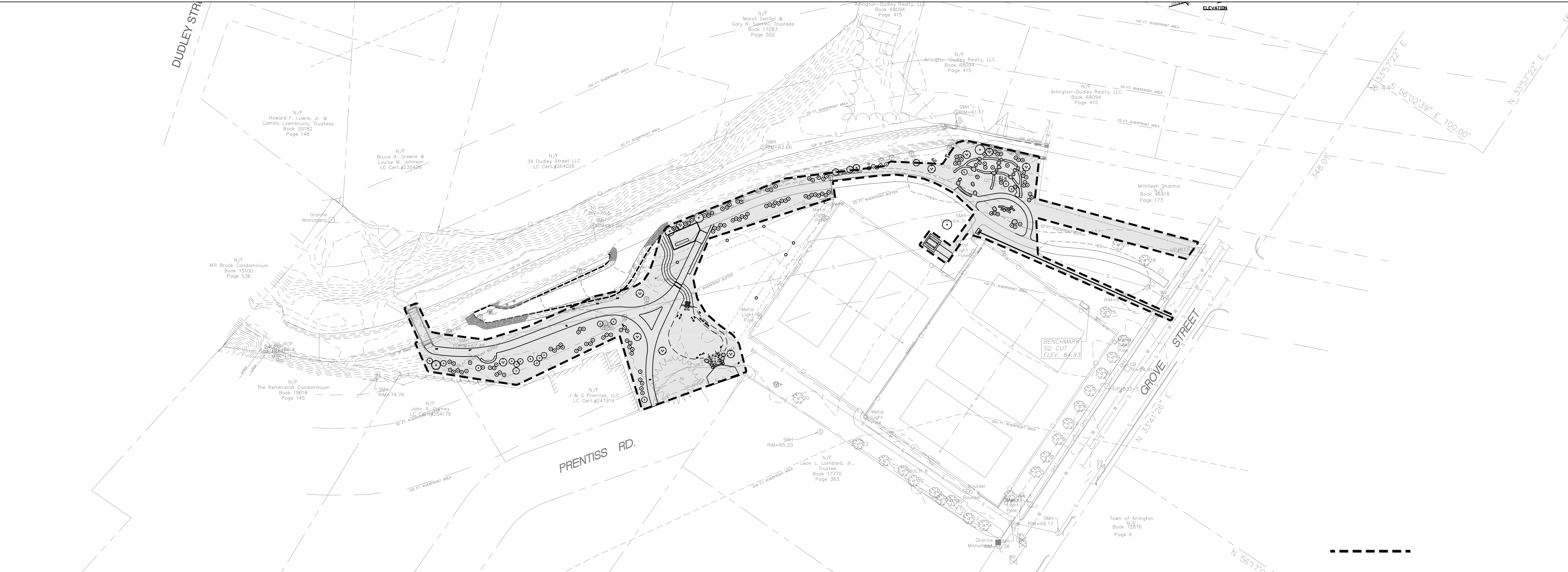
1. Complete inspections as noted and after major storm event (as directed by Parks and Recreation Manager).
2. All facilities should drain within 24 hours, if ponding is observed notify Arlington Parks and Recreation.
3. Maintain an annual inspection and maintenance log (including this form) with a summary of completed remediation efforts (ie. Date, contractor (if applicable), replacement plant material, invasive plants removed, structural repairs, and costs).
4. Record photos (from consistent locations) should be taken of each facility during each inspection.
5. If ponding is observed, notify Arlington Parks and Recreation. Record time, date, weather, and site conditions.
6. The Contractor shall provide the following seasonal focus to their work:
 - a. Spring - Blow off surface of porous paving and vacuum in late spring. Replant exposed soil and re-seed as necessary.
 - b. Summer - Make structural repairs to porous paving.
 - c. Fall - Replace exposed soil and dead plants, remove leaves, sediment, and vacuum.
 - d. Winter - Monitor infiltration/ flow-through rates. Plow surface as needed. Do not apply sand to paving surface.

Appendix G – Drawings

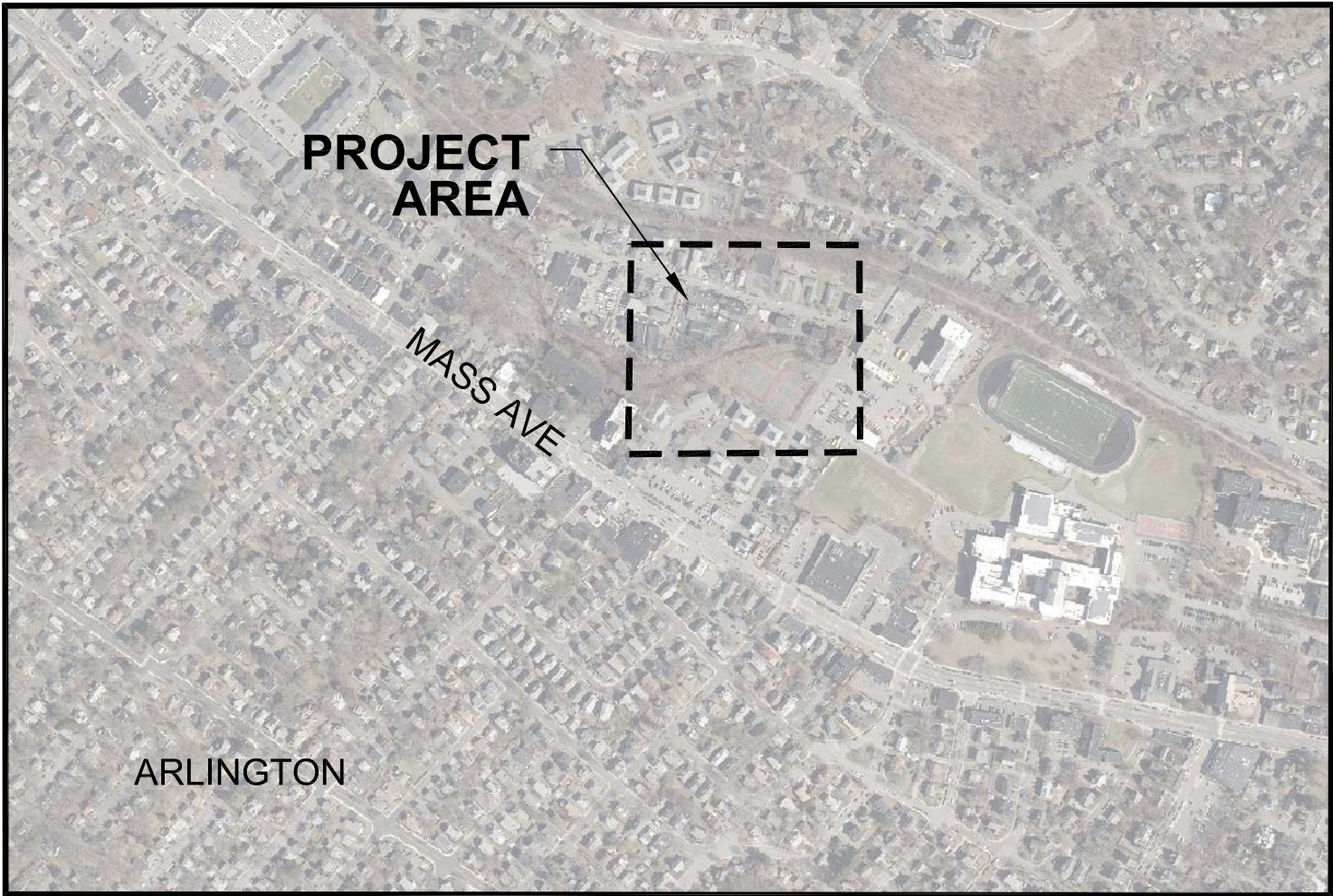
WELLINGTON PARK & MILL BROOK CORRIDOR REVITALIZATION PROJECT

75% CONSTRUCTION DOCUMENTS
SEPTEMBER 17, 2020

PROJECT LOCATION PLAN



SITE LOCUS PLAN - ARLINGTON



SCALE: NTS

PROJECT DESCRIPTION

THE ARLINGTON PARK AND RECREATION COMMISSION AND ITS PARTNERS WISH TO COMPLETE A COMMUNITY-DRIVEN DESIGN THAT WILL IMPROVE PASSIVE RECREATIONAL OPPORTUNITIES AT WELLINGTON PARK IN A MANNER THAT USES ENVIRONMENTALLY SUSTAINABLE APPROACHES WHILE MEETING THE FOLLOWING GOALS:

- INCREASE ACCESS WITHIN THE PARK AND ALONG THE BROOK WITH APPROXIMATELY XX LF OF NEW POROUS PATHWAY
- INCREASE RECREATIONAL QUALITY AND OPPORTUNITY WITH NEW SITE AMENITIES INCLUDING BENCHES, PICNIC TABLE, DRINKING FOUNTAIN AND NATURALISTIC EXPLORATION AREA
- PROTECT AND ENHANCE WILDLIFE HABITAT ALONG THE BROOK WITH NATIVE PLANTINGS DERIVED FROM A PLANT COMMUNITY BASED APPROACH
- IMPROVE WATER QUALITY OF WELLINGTON BROOK BY PREVENTING DIRECT RUNOFF INTO THE BROOK AND INCREASING STORMWATER INFILTRATION

DRAWING INDEX

SHEET NO.	SHEET TITLE
-	COVER SHEET
EC-1	EXISTING CONDITIONS PLAN
SP-1	SITE PREPARATION PLAN
L-1	SITE PLAN
L-2	PLANTING PLAN
L-3	NATURALISTIC EXPLORATION AREA ENLARGEMENT PLAN AND DETAILS
L-4	BIORETENTION BASIN AND SWALE ENLARGEMENT PLAN AND DETAILS
L-5	BOARDWALK ENLARGEMENT PLAN AND DETAILS
L-6	SITE DETAILS
L-7	PLANTING DETAILS



Client/Owner:



Town of Arlington
422 Summer Street, Arlington, MA 02474

HATCH

27 Congress Street, Salem, MA 01970
tel. 978-740-0096 www.hatch.com

Stamp:



Project:

WELLINGTON PARK & MILL BROOK CORRIDOR
REVITALIZATION PROJECT: PHASE 3

WELLINGTON PARK - ARLINGTON, MA
75% CONSTRUCTION DOCUMENTS

Project Number: 00205072-00

Hatch Project Number: H-362472

Date: September 17, 2020

Drawn By: AK, AG

Designed By: AK

Reviewed By: DB

Scale: As shown

Revisions

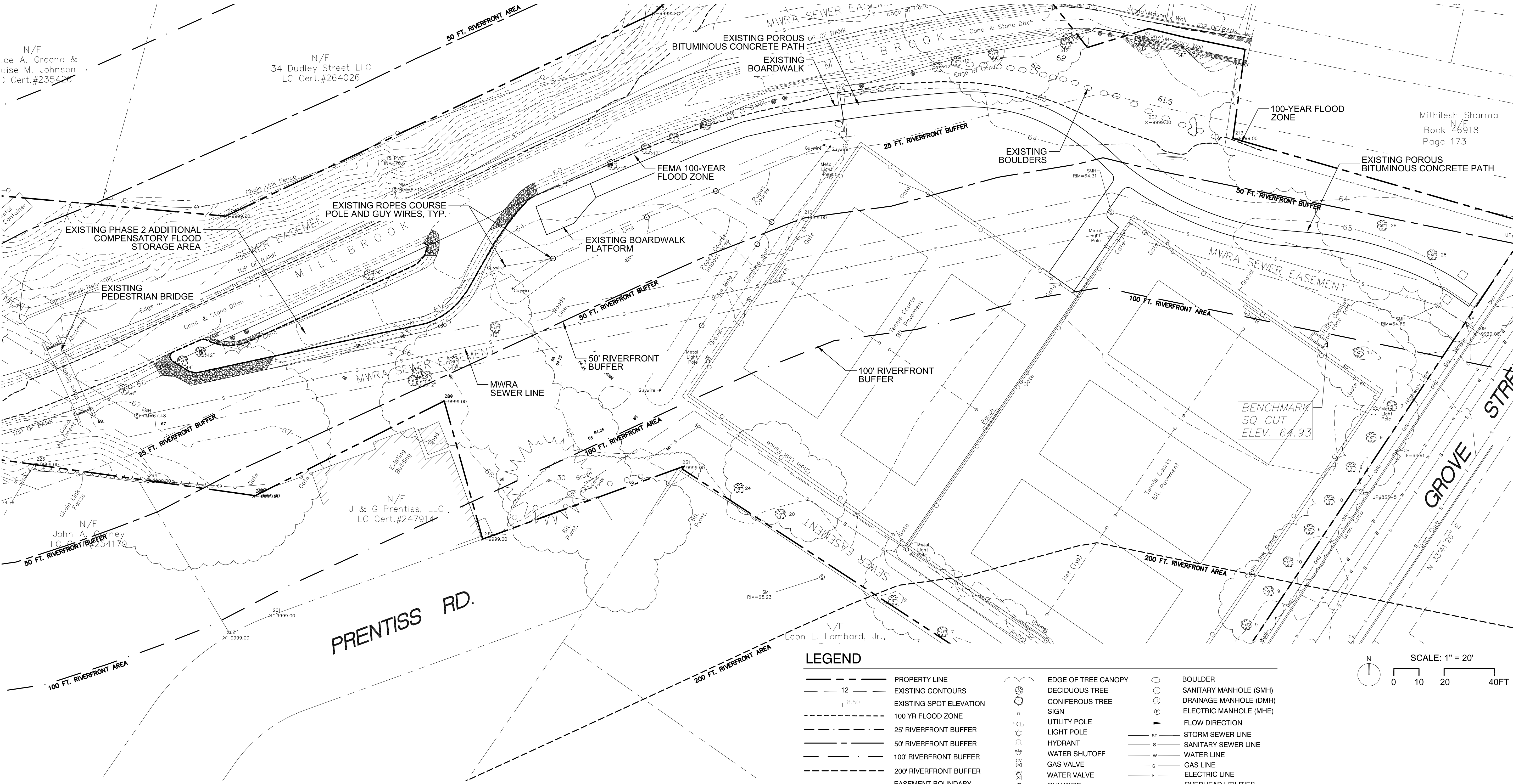
Number: Description: Date:

Sheet Title:

COVER SHEET

Sheet No:

L-0



SURVEY NOTES

- TOPOGRAPHIC SURVEY INFORMATION IS A COMBINATION OF AN ON-THE-GROUND INSTRUMENT SURVEY BY WESTON AND SAMPSON LAND SURVEYORS, INC. IN SEPTEMBER 2018 (WESTON & SAMPSON ENGINEERS, INC. 5 CENTENNIAL DRIVE, PEABODY, MA 01960, TEL: 978 532 1900), AND AS-BUILT GRADES FROM THE PREVIOUS PROJECT PHASE.
- THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE EXISTING CONDITIONS SHOWN ON THESE PLANS FROM THE AS-BUILT INFORMATION OF THE PREVIOUS PROJECT PHASE SHOULD NOT BE RELIED UPON AS BEING EXACT OR COMPLETE. THE CONTRACTOR, PRIOR TO THE START OF CONSTRUCTION, SHALL THOROUGHLY REVIEW THE EXISTING CONDITIONS AS THEY RELATE TO THESE SITE PLAN DRAWINGS AND NOTIFY LANDSCAPE ARCHITECT OF ANY DISCREPANCIES PRIOR TO THE START OF CONSTRUCTION.
- BEARINGS REFER TO THE MASSACHUSETTS NAD 83 STATE PLANE COORDINATE SYSTEM (MAINLAND ZONE).
- ELEVATIONS REFER TO THE 1988 NORTH AMERICAN DATUM (NAVD 88).
- REFERENCE IS MADE TO THE FOLLOWING MAPS:
 - "PLAN OF BUILDING LOTS IN ARLINGTON MASS. BELONGING TO W.M. RICHARDSON", BY JOSIAH HOVEY, SCALE 1" =50', DATED JUNE 1869, RECORDED IN PLAN BOOK 86, PLAN 2 OF THE MIDDLESEX SOUTH REGISTRY OF DEEDS.
 - "PLAN OF LOTS BELONGING TO GEORGIANNA HOBBS ARLINGTON, MASS.", BY JAMES ADAM, SCALE 1"=40', DATED FEBRUARY 1906, RECORDED IN PLAN BOOK 200, PLAN 37 OF THE MIDDLESEX SOUTH REGISTRY OF DEEDS.
 - "SECTION 80 MILL BROOK VALLEY SEWER NORTH METROPOLITAN SYSTEM ARLINGTON", DATED JULY 1926.
 - "PLAN OF LAND IN ARLINGTON MASS.", BY C.H. GANNETT CO., SCALE 1" =30', DATED AUGUST 1927, RECORDED AS PLAN 979 OF 1931 OF THE MIDDLESEX SOUTH REGISTRY OF DEEDS.
 - "PLAN OF LAND IN ARLINGTON MASS. TO BE TAKEN FOR PARK PURPOSES", BY JAMES M. KEANE, SCALE 1" =30', DATED FEB. 14, 1933, RECORDED AS PLAN 182 OF 1933 OF THE MIDDLESEX SOUTH REGISTRY OF DEEDS.
 - "PLAN SHOWING LAND TO BE TRANSFERRED IN ARLINGTON MASS.", BY JAMES M. KEANE, SCALE 1" =30', DATED FEB. 14, 1933, RECORDED AS PLAN 38 OF 1934 OF THE MIDDLESEX SOUTH REGISTRY OF DEEDS.
 - "DENNIS HURLEY PLAN OF LAND GROVE STREET ARLINGTON", BY RALPH ADAMS, SCALE 1" =20', DATED DEC. 9, 1933, RECORDED AS PLAN 20 OF 1934 OF THE MIDDLESEX SOUTH REGISTRY OF DEEDS.
 - "SUBDIVISION OF LAND IN ARLINGTON MASS.", BY JOS. J. SULLIVAN, SCALE 1"=20', DATED MAY 1976, RECORDED AS PLAN 761 OF 1946 OF THE MIDDLESEX SOUTH REGISTRY OF DEEDS.
 - "SUBDIVISION OF LAND IN ARLINGTON MASS", BY T.F. GEARY, SCALE 1" =20', DATED OCT. 30, 1947, RECORDED AS PLAN 449 OF 1949 OF THE MIDDLESEX SOUTH REGISTRY OF DEEDS.
 - LAND COURT PLAN 20878A DATED OCTOBER 1947.
 - LAND COURT PLAN 22019A DATED SEPTEMBER 1949.
 - "PLAN OF THE RELOCATION OF GROVE STREET ARLINGTON AS ORDERED BY THE COUNTY COMMISSIONERS", SCALE 1" =40', DATED 1964, RECORDED AS PLAN 133 OF 1964 OF THE MIDDLESEX SOUTH REGISTRY OF DEEDS.
 - "SECTION 92 MILL BROOK VALLEY RELIEF SEWER NORTH METROPOLITAN SYSTEM ARLINGTON", DATED MAY 1966.
 - "THE COMMONWEALTH OF MASSACHUSETTS METROPOLITAN DISTRICT COMMISSION SEWERAGE DIVISION PLAN OF LAND IN ARLINGTON", SCALE 1"=40', DATED MAY 1966, RECORDED AS PLAN 281 OF 1967 OF THE MIDDLESEX SOUTH REGISTRY OF DEEDS.
 - "PLAN OF LAND IN ARLINGTON MASS.", BY CURLEY & HANSEN, SCALE 1" =20', DATED MAY 29, 1971, RECORDED AS PLAN 657 OF 1971 OF THE MIDDLESEX SOUTH REGISTRY OF DEEDS.
 - LAND COURT PLAN 4481B DATED APRIL 26, 1969.
 - "PLAN OF LAND IN ARLINGTON MASS. SHOWING SEWER & WATER EASEMENT", BY R.L. HIGGINS, SCALE 1" =40', DATED JAN. 1973, RECORDED AS PLAN 65 OF 1973 OF THE MIDDLESEX SOUTH REGISTRY OF DEEDS.
 - "PLAN OF LAND IN ARLINGTON MASS.", BY HAYES ENGINEERING INC., SCALE 1"=30', DATED JANUARY 31, 1983, RECORDED AS PLAN 144 OF 1983 OF THE MIDDLESEX SOUTH REGISTRY OF DEEDS.
 - "PLAN OF LAND IN ARLINGTON MA. PREPARED FOR ROSE-MAL HERITAGE REALTY TRUST", BY DAVID D. LANATA & ASSOC., INC., SCALE 1" =20', DATED JUNE 24, 1987, RECORDED AS PLAN 1185 OF 1987 OF THE MIDDLESEX SOUTH REGISTRY OF DEEDS.
 - LAND COURT PLAN 4481C DATED OCTOBER 11, 2001.
 - "SITE PLAN 19 PRENTISS ROAD ARLINGTON MA. 02147", BY PFS LAND SURVEYING, INC., SCALE 1" =10', DATED 12/24/2013, RECORDED AS PLAN 473 OF 2014 OF THE MIDDLESEX SOUTH REGISTRY OF DEEDS.
- THE PROPERTY IS TOGETHER WITH AND SUBJECT TO SUCH EASEMENTS AND RIGHTS OF RECORD AS MAY APPEAR.
- UNDERGROUND UTILITY, STRUCTURE AND FACILITY LOCATIONS DEPICTED HEREON HAVE BEEN COMPILED, IN PART, FROM RECORD MAPPING AND OTHER DATA SUPPLIED BY THE RESPECTIVE UTILITY COMPANIES, GOVERNMENTAL AGENCIES AND/OR OTHER SOURCES. THESE LOCATIONS MUST BE CONSIDERED APPROXIMATE IN NATURE. ADDITIONALLY, OTHER SUCH FEATURES MAY EXIST ON THE SITE, THE EXISTENCE OF WHICH ARE UNKNOWN TO WESTON & SAMPSON. THE EXISTENCE, SIZE AND LOCATION OF ALL SUCH FEATURES MUST BE DETERMINED AND VERIFIED IN THE FIELD BY THE APPROPRIATE AUTHORITIES PRIOR TO CONSTRUCTION. CALL BEFORE YOU DIG.

Client/Owner:

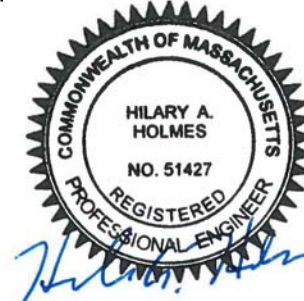


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Project:

WELLINGTON PARK & MILL BROOK CORRIDOR
REVITALIZATION PROJECT: PHASE 3

WELLINGTON PARK - ARLINGTON, MA

75% CONSTRUCTION DOCUMENTS

Project Number: 00205072-00

Hatch Project Number: H-362472

Date: September 17, 2020

Drawn By: AK, AG

Designed By: AK

Reviewed By: DB

Scale: As shown

Revisions

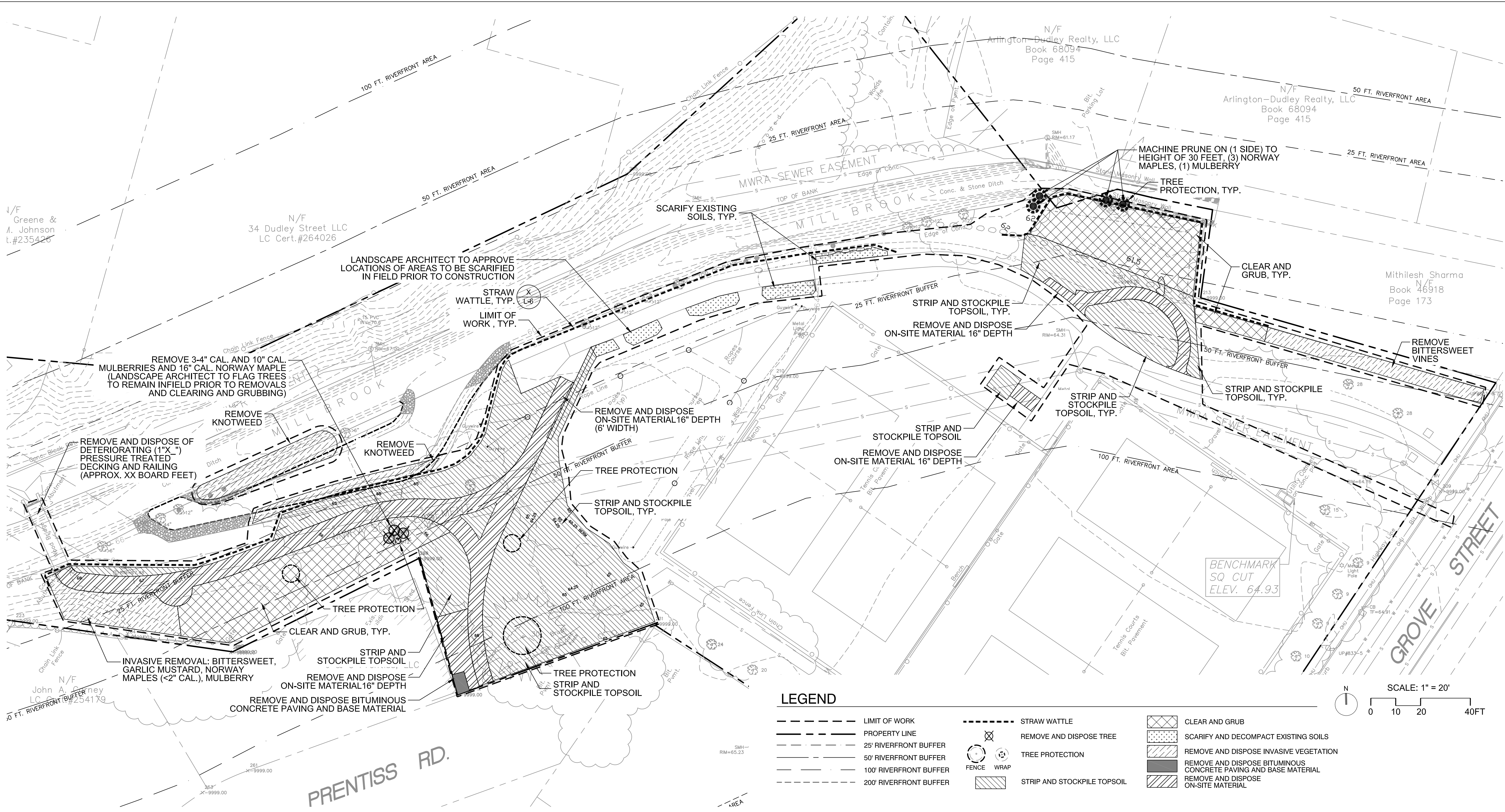
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EXISTING CONDITIONS

Sheet No:

EC-1



SITE PREPARATION, DEMOLITION AND EROSION CONTROL NOTES

- THE CONTRACTOR IS CAUTIONED THAT LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AND STRUCTURES, AS SHOWN ON THESE PLANS, IS BASED ON SITE SURVEY AND FIELD MEASUREMENTS. THIS INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. CONTRACTOR, PRIOR TO THE START OF CONSTRUCTION, SHALL VERIFY THE LOCATION OF ALL UNDERGROUND UTILITIES AND STRUCTURES IN THE FIELD. CONTRACTOR MUST CONTACT THE APPROPRIATE UTILITY COMPANY, ANY GOVERNING PERMITTING AUTHORITY, AND "DIG SAFE" AT LEAST 72 HOURS PRIOR TO ANY EXCAVATION WORK TO REQUEST THE EXACT FIELD LOCATION OF UTILITIES AND THE LANDSCAPE ARCHITECT SHALL BE NOTIFIED, IN WRITING, OF ANY UTILITIES INTERFERING WITH THE PROPOSED CONSTRUCTION AND APPROPRIATE REMEDIAL ACTIONS TAKEN BEFORE PROCEEDING WITH THE WORK. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLAN.
- MATERIAL RESULTING FROM THE DEMOLITION OF ANY EXISTING STRUCTURE SHALL BE REMOVED AND DISPOSED OF IN ACCORDANCE WITH ALL LOCAL AND STATE REGULATIONS. THE CONTRACTOR SHALL NOT BURY OR ALLOW TO BURY SUCH MATERIAL. THIS INCLUDES FENCING, EXISTING STRUCTURES, TREE STUMPS, ETC.
- ALL ITEMS CALLED FOR REMOVAL SHALL BE REMOVED TO FULL DEPTH INCLUDING ALL FOOTINGS, FOUNDATIONS, AND OTHER

- APPURTENANCES, EXCEPT AS SPECIFICALLY NOTED OTHERWISE, OR DIRECTED BY THE LANDSCAPE ARCHITECT.
- LANDSCAPE ARCHITECT SHALL VERIFY TREES & STUMPS TO BE REMOVED IN THE FIELD PRIOR TO REMOVAL.
- POISON IVY AND INVASIVE PLANTS ON SITE THAT ARE TO BE REMOVED SHALL BE CONFIRMED BY THE LANDSCAPE ARCHITECT.
- PROTECT ALL LIGHT FIXTURES AND SITE AMENITIES UNLESS NOTED OTHERWISE.

SITE PREPARATION AND EROSION CONTROL NOTES

- PROTECT ALL EXISTING STRUCTURES TO REMAIN.
- PROPERTY LINE, EXISTING UTILITY INFORMATION AND TOPOGRAPHY TAKEN FROM THE PLAN PREPARED BY NITSCH ENGINEERING, INC.
- EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE IN PLACE PRIOR TO COMMENCEMENT OF ANY SITE WORK OR EARTHWORK OPERATIONS. CONTRACTOR SHALL NOTIFY LANDSCAPE ARCHITECT UPON INSTALLATION FOR APPROVAL. ALL MEASURES SHALL BE MAINTAINED DURING CONSTRUCTION, AND SHALL REMAIN

- IN PLACE UNTIL ALL SITE WORK IS COMPLETE AND GROUND COVER IS ESTABLISHED.
- STOCKPILES SHALL BE SURROUNDED ON THEIR PERIMETERS WITH STAKED HAY BALES AND/OR SILTATION FENCES TO PREVENT AND/OR CONTROL SILTATION AND EROSION.
- ALL DISTURBED OR EXPOSED AREAS SUBJECT TO EROSION SHALL BE STABILIZED WITH MULCH OR SEEDED FOR TEMPORARY VEGETATIVE COVER. NO AREA, SUBJECT TO EROSION, SHALL BE LEFT DISTURBED AND UNSTABILIZED FOR PERIODS LONGER THAN IS ABSOLUTELY NECESSARY TO CARRY OUT THAT PORTION OF THE CONSTRUCTION WORK.
- INSPECTION SHALL TAKE PLACE AFTER EACH RAINFALL EVENT. ALL EROSION CONTROL MEASURES SHALL BE ROUTINELY INSPECTED, CLEANED, AND REPAIRED OR REPLACED, AS NECESSARY, THROUGHOUT CONSTRUCTION.
- THE LOCATION OF STRAWBALE CHECK DAMS SHALL BE FIELD VERIFIED DURING SITE PREPARATION OPERATIONS BY THE LANDSCAPE ARCHITECT OR ENGINEER.
- ALL PROPOSED SLOPES 3:1 OR STEEPER SHALL BE STABILIZED WITH EROSION CONTROL MAT AND PROTECTED FROM EROSION.

- THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND PAYING FOR ANY PERMITS AND/OR CONNECTION MWRA FEES REQUIRED TO CARRY OUT THE WORK INCLUDING, BUT NOT LIMITED TO, DEMOLITION, SITE CONSTRUCTION, ELECTRICAL, STORM AND WATER UTILITIES.
- SALVAGE ALL EXISTING SITE FURNISHINGS UNLESS NOTED OTHERWISE. IF FURNISHING IS IN CONFLICT WITH PROPOSED WORK, CONTACT THE LANDSCAPE ARCHITECT IMMEDIATELY.
- THE AREA, OR AREAS, OF ENTRANCE AND EXIT, TO AND FROM THE SITE, SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO A PUBLIC RIGHT-OF-WAY MUST BE REMOVED IMMEDIATELY.
- FINAL TREE PROTECTION FENCE LOCATIONS SHALL BE DETERMINED IN THE FIELD PRIOR TO CONSTRUCTION ACTIVITY AS DIRECTED BY THE LANDSCAPE ARCHITECT AND MAY DIFFER FROM CONSTRUCTION DOCUMENTS.
- SEE PLANS FOR TREE PROTECTION AND CLEARING LIMITS.

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Project:

**WELLINGTON PARK & MILL BROOK CORRIDOR
REVITALIZATION PROJECT: PHASE 3**

WELLINGTON PARK - ARLINGTON, MA

75% CONSTRUCTION DOCUMENTS

Project Number: 00205072-00

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Reviewed By: DB

Scale: As shown

Revisions

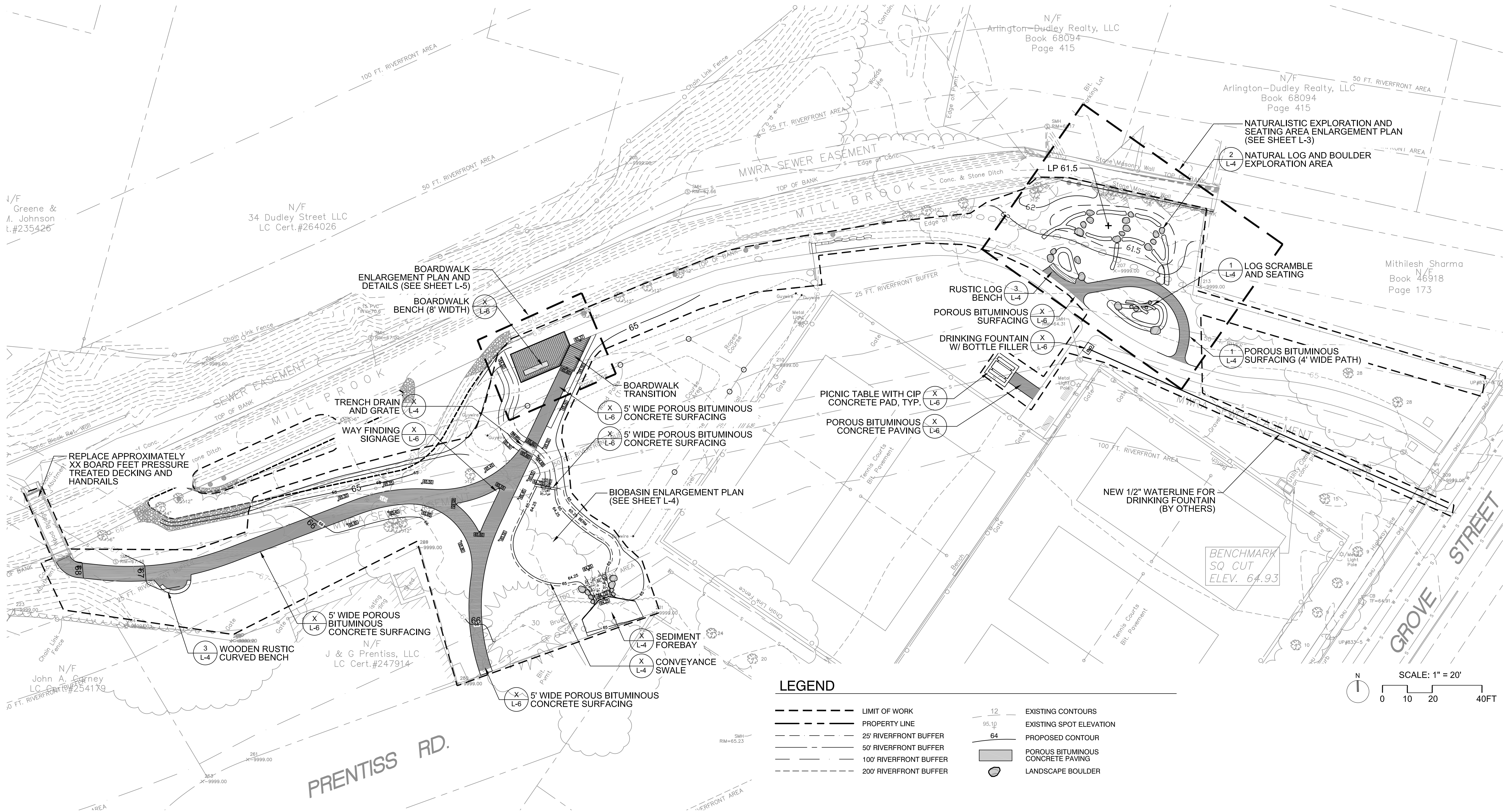
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**SITE PREPARATION
PLAN**

Sheet No:

SP-1



LAYOUT AND MATERIAL NOTES:

- ALL LAYOUT LINES, OFFSETS OR REFERENCES TO LOCATING OBJECTS ARE EITHER PARALLEL OR PERPENDICULAR UNLESS OTHERWISE DESIGNATED WITH ANGLE OFFSETS NOTED.
- ALL PROPOSED SITE IMPROVEMENTS SHALL BE LAID OUT AND STAKED FOR REVIEW AND APPROVAL PRIOR TO INSTALLATION BY THE LANDSCAPE ARCHITECT. ANY REQUIRED ADJUSTMENTS SHALL BE UNDERTAKEN AT NO ADDITIONAL COST TO THE OWNER.
- REFER TO SP-1 FOR SITE PREPARATION, DEMOLITION AND EROSION CONTROL LAYOUT.
- PRIOR TO COMMENCEMENT OF ANY CONSTRUCTION WORK INDICATED IN THE CONSTRUCTION DOCUMENTS, THE CONTRACTOR SHALL VERIFY THE PATHWAY BASELINE SHOWN IS CONSISTENT WITH THE EXISTING PATHWAY ALIGNMENT INDICATED WITHIN THE CONSTRUCTION DOCUMENTS. THE CONTRACTOR SHALL NOTIFY THE OWNER AND THE LANDSCAPE ARCHITECT OF ANY DISCREPANCIES BETWEEN THE TWO.

GRADING AND DRAINAGE NOTES

- THE CONTRACTOR SHALL VERIFY ALL GRADES IN THE FIELD AND REPORT ANY DISCREPANCIES BETWEEN PROPOSED AND EXISTING IMMEDIATELY TO THE LANDSCAPE ARCHITECT.
- ALL PROPOSED PAVEMENTS SHALL SMOOTHLY MEET THE LINE, GRADE AND EDGES OF EXISTING ADJACENT PAVEMENT SURFACES AS WELL THE TOP OF RAMPS AND BACK OF CURBS.
- WHERE NEW EARTHWORK MEETS EXISTING EARTHWORK, CONTRACTOR SHALL BLEND THE GRADES SMOOTHLY, PROVIDING VERTICAL CURVES OR ROUNDS AT ALL TOP AND BOTTOM OF SLOPES, AND ELIMINATE ROUGH SPOTS AND ABRUPT GRADE CHANGES.
- CONTRACTOR SHALL ENSURE ALL AREAS PROPERLY PITCH TO DRAIN, WITH NO SURFACE WATER PONDING OR PUDDLING UNLESS OTHERWISE INDICATED ON THE CONSTRUCTION DRAWINGS.
- ALL NEW WALKWAY / ACCESS PATH GRADING MUST CONFORM TO CURRENT AMERICANS WITH DISABILITIES ACT (ADA), AND MASSACHUSETTS ARCHITECTURAL ACCESS BOARD (MAAB) REGULATIONS: WALKWAYS SHALL MAINTAIN A CROSS PITCH OF NOT MORE THAN ONE AND A HALF (1.5%) PERCENT AND THE RUNNING SLOPE (PARALLEL TO THE DIRECTION OF TRAVEL) BETWEEN 1% MIN. AND 4.5% MAX. ANY DISCREPANCIES NOT ALLOWING THIS TO OCCUR SHALL BE REPORTED TO THE OWNERS REPRESENTATIVE PRIOR TO CONTINUING WORK.

- ALL UTILITY GRATES, COVERS OR OTHER SURFACE ELEMENTS INTENDED TO BE EXPOSED AT GRADE SHALL BE FLUSH WITH THE ADJACENT FINISHED GRADE AND ADJUSTED TO PROVIDE A SMOOTH TRANSITION AT ALL EDGES.
- EXCAVATION REQUIRED WITHIN PROXIMITY OF KNOWN EXISTING UTILITY LINES SHALL BE DONE BY HAND. CONTRACTOR SHALL REPAIR ANY DAMAGE TO EXISTING UTILITY LINES OR STRUCTURES INCURRED DURING CONSTRUCTION OPERATIONS AT NO COST TO THE OWNER.
- GRADES ABOVE THE SEWER EASEMENT SHALL NOT CHANGE UNLESS OTHERWISE INDICATED ON THE CONSTRUCTION DOCUMENTS.
- THE CONTRACTOR IS CAUTIONED THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AND STRUCTURES, AS SHOWN ON THESE PLANS, IS BASED ON THE EXISTING SURVEY. THIS INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR, PRIOR TO THE START OF CONSTRUCTION, SHALL VERIFY THE LOCATION OF ALL UNDERGROUND UTILITIES AND STRUCTURES IN THE FIELD. THE CONTRACTOR MUST CONTACT THE APPROPRIATE UTILITY COMPANY, AND ANY GOVERNING PERMITTING AUTHORITY, AT LEAST 72 HOURS PRIOR TO ANY EXCAVATION WORK

TO REQUEST THE EXACT FIELD LOCATION OF UTILITIES AND THE LANDSCAPE ARCHITECT SHALL BE NOTIFIED, IN WRITING, OF ANY UTILITIES INTERFERING WITH THE PROPOSED CONSTRUCTION AND APPROPRIATE REMEDIAL ACTIONS TAKEN BEFORE PROCEEDING WITH THE WORK. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLAN.

10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING AND MAINTAINING ALL CONTROL POINTS AND BENCH MARKS NECESSARY FOR THE WORK.

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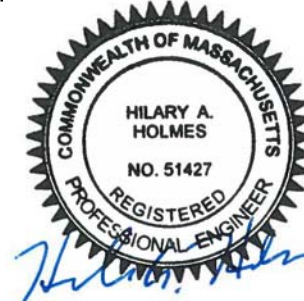


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Project:

WELLINGTON PARK & MILL BROOK CORRIDOR
REVITALIZATION PROJECT: PHASE 3

WELLINGTON PARK - ARLINGTON, MA
75% CONSTRUCTION DOCUMENTS

Project Number: 00205072-00

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Revisions

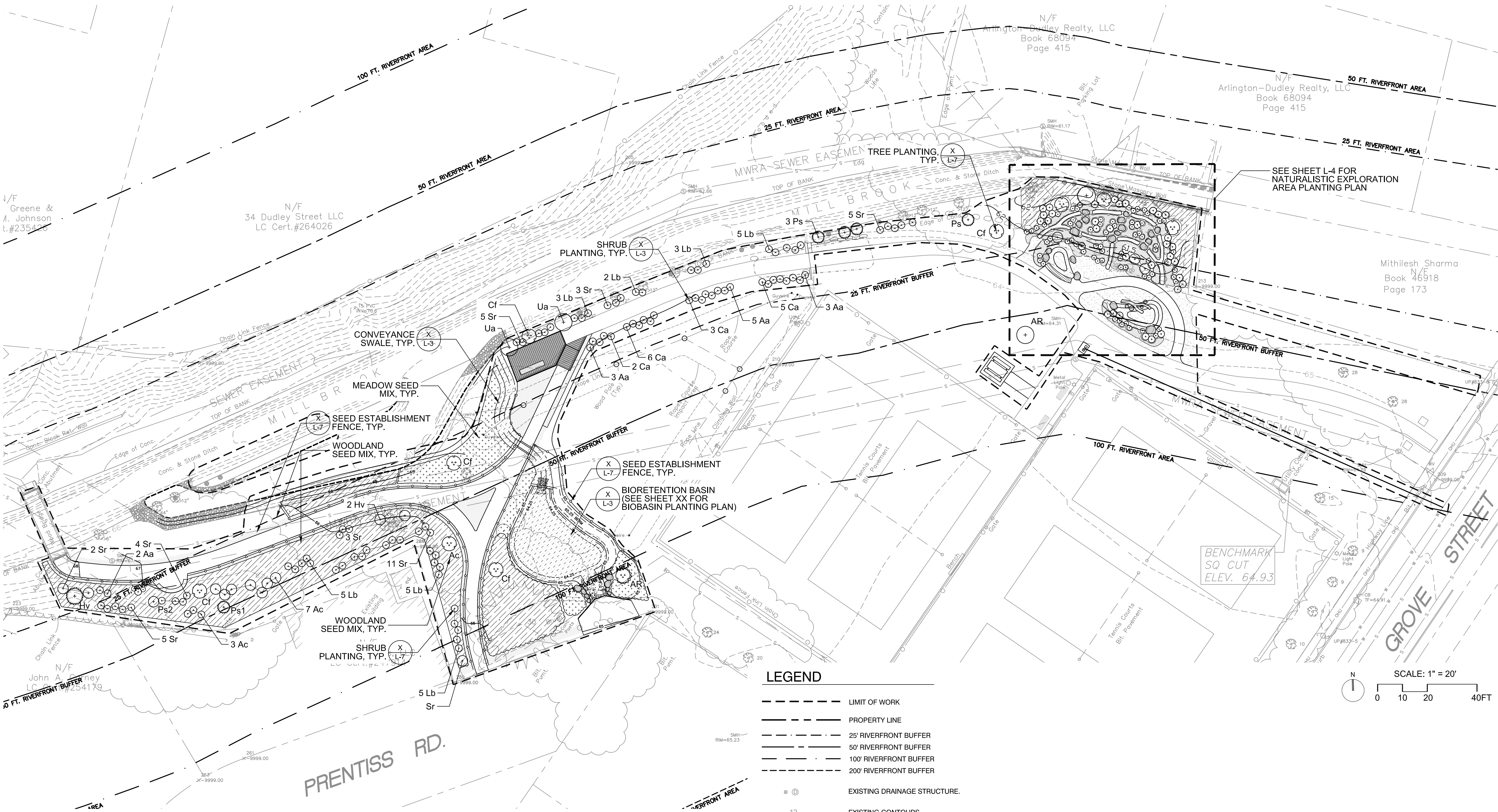
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SITE PLAN

Sheet No:

L-1



PLANTING NOTES

1. SUBSTITUTIONS OF PLANT SPECIES SHALL NOT BE PERMITTED, IN CASES WHERE INDIVIDUAL SPECIES ARE NOT COMMERCIALY AVAILABLE, QUANTITIES WILL BE MADE UP WITH ANOTHER SPECIES IN THE PLANT SCHEDULE AFTER WRITTEN APPROVAL BY THE LANDSCAPE ARCHITECT.
2. ALL SPECIES SHALL BE STRAIGHT SPECIES; NO CULTIVARS.
3. ALL PLANT MATERIAL SHALL CONFORM TO THE MINIMUM GUIDELINES ESTABLISHED FOR NURSERY STOCK PUBLISHED BY THE AMERICAN HORTICULTURE INDUSTRY ASSOCIATION. IN ADDITION, ALL NEW PLANT MATERIAL FOR THE PROJECT SHALL BE OF SPECIMEN QUALITY.
4. CONTRACTOR SHALL MAKE ARRANGEMENTS WITH NURSERY(IES) AND OWNER WITHIN THIRTY (30) DAYS OF AWARD OF CONTRACT.
5. CONTRACTOR SHALL SUPPLY ALL PLANT MATERIAL IN QUANTITIES SUFFICIENT TO COMPLETE THE PLANTING PLAN AS SHOWN ON DRAWINGS.
6. NO PLANT MATERIAL SHALL BE PLANTED BEFORE ACCEPTANCE OF FINAL GRADING AND SLOPE TREATMENTS BY THE LANDSCAPE ARCHITECT.
7. WATERING OF INSTALLED PLANTS AND SEEDED AREAS, SHALL OCCUR WITHIN 24 HOURS OF THE FIRST DAY OF PLANTING OR SEEDING AND CONTINUE AS OUTLINED IN THE CONTRACT DOCUMENTS.
8. CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACING ALL DAMAGED, STOLEN, DEAD, DECLINING OR LOST PLANT MATERIAL UNTIL THE COMPLETION OF THE MAINTENANCE AND GUARANTEE PERIODS.
9. ALL PLANT MATERIAL SHALL BE NURSERY GROWN. NO FIELD-COLLECTED SPECIMENS WILL BE ALLOWED.
10. ALL NEW PLANTS SHALL BE B&B TREES, CONTAINERIZED TREES AND SHRUBS, OR HERBACEOUS PERENNIALS, UNLESS OTHERWISE NOTED ON THE PLANT SCHEDULE.
11. ALL NEW PLANTS SHALL BE TAGGED AND APPROVED BY THE LANDSCAPE ARCHITECT AT THE NURSERY PRIOR TO DELIVERY TO SITE. TAGGING REPRESENTATIVE SAMPLES OF SHRUBS AND HERBACEOUS MATERIAL MAY BE ACCEPTABLE WITH PRIOR APPROVAL.
12. ALL AREAS TO BE SEEDDED OR DISTURBED SHALL RECEIVE SOIL PREPARATION AS SPECIFIED PRIOR TO SEEDING.
13. CONTRACTOR SHALL LOCATE AND MARK ALL EXISTING AND PROPOSED UTILITIES TO VERIFY PROPOSED PLANT LOCATIONS AND SHALL REPORT ANY CONFLICTS TO THE LANDSCAPE ARCHITECT.
14. CONTRACTOR SHALL STAKE ALL PROPOSED TREE LOCATIONS FOR REVIEW AND POTENTIAL ADJUSTMENT BY LANDSCAPE ARCHITECT.
15. INSTALLATION OF HERBACEOUS MATERIAL IN MIXED PLANTING BEDS SHALL OCCUR ONLY AFTER SHRUBS AND/OR TREES HAVE BEEN INSTALLED.

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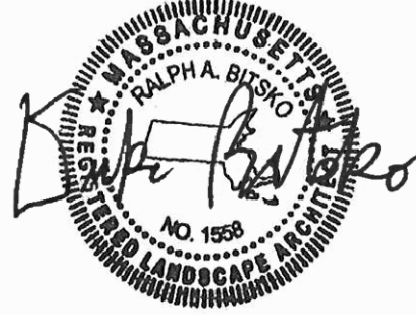


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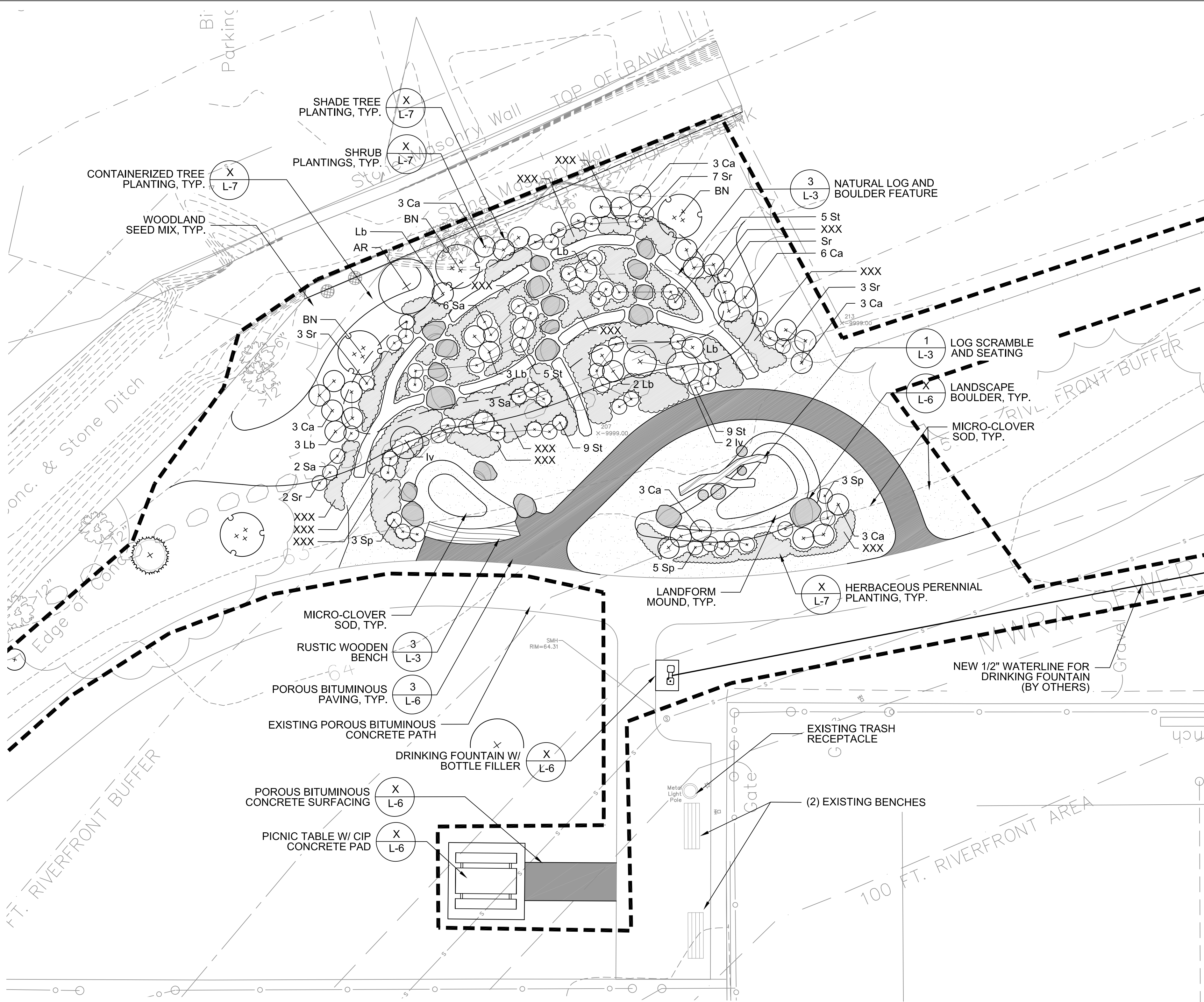
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PLANTING PLAN

Sheet No:

L-2

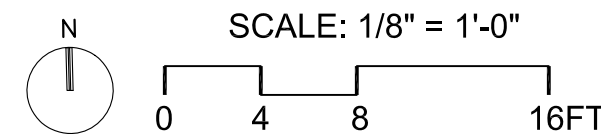


NOTES:

1. FINAL LOCATIONS OF ALL SITE FURNISHINGS SHALL BE APPROVED IN THE FIELD BY THE LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.
2. IT IS THE CONTRACTOR'S RESPONSIBILITY TO THOROUGHLY REVIEW THESE SITE PLAN DRAWINGS AND NOTIFY THE PLAN PREPARERS OF ANY DISCREPANCIES PRIOR TO THE START OF CONSTRUCTION.
3. SEE SHEET L-1 FOR LAYOUT, MATERIAL, GRADING AND DRAINAGE NOTES.
4. SEE SHEET L-2 FOR PLANTING NOTES.
5. SEE SHEET L-7 FOR PLANT SCHEDULE.

LEGEND

---	LIMIT OF WORK
---	PROPERTY LINE
---	25' RIVERFRONT BUFFER
---	50' RIVERFRONT BUFFER
---	100' RIVERFRONT BUFFER
---	200' RIVERFRONT BUFFER
---	EXISTING CONTOURS
---	EXISTING SPOT ELEVATION
---	PROPOSED SPOT ELEVATION
---	PROPOSED CONTOUR
---	PROPOSED SLOPE



3 RUSTIC WOODEN BENCH
SCALE: NTS



2 NATURAL LOG AND BOULDER FEATURE
SCALE: NTS



1 LOG SCRAMBLE AND SEATING
SCALE: NTS

Client/Owner:

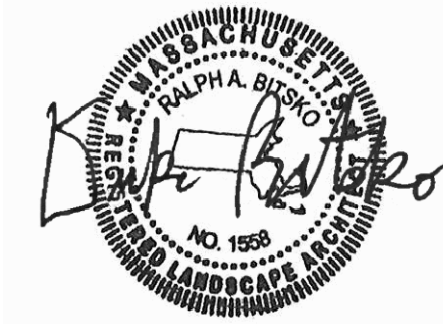


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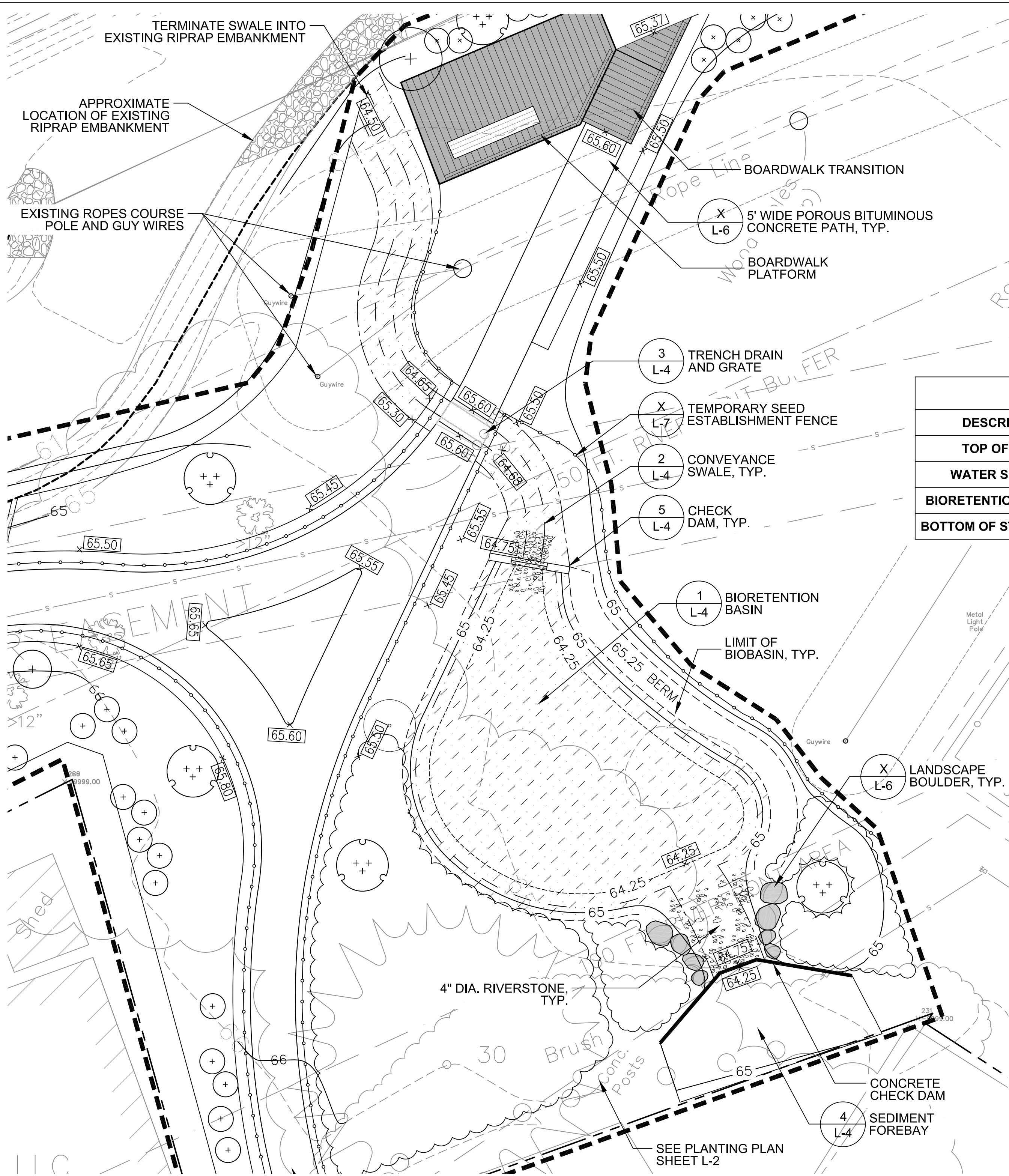
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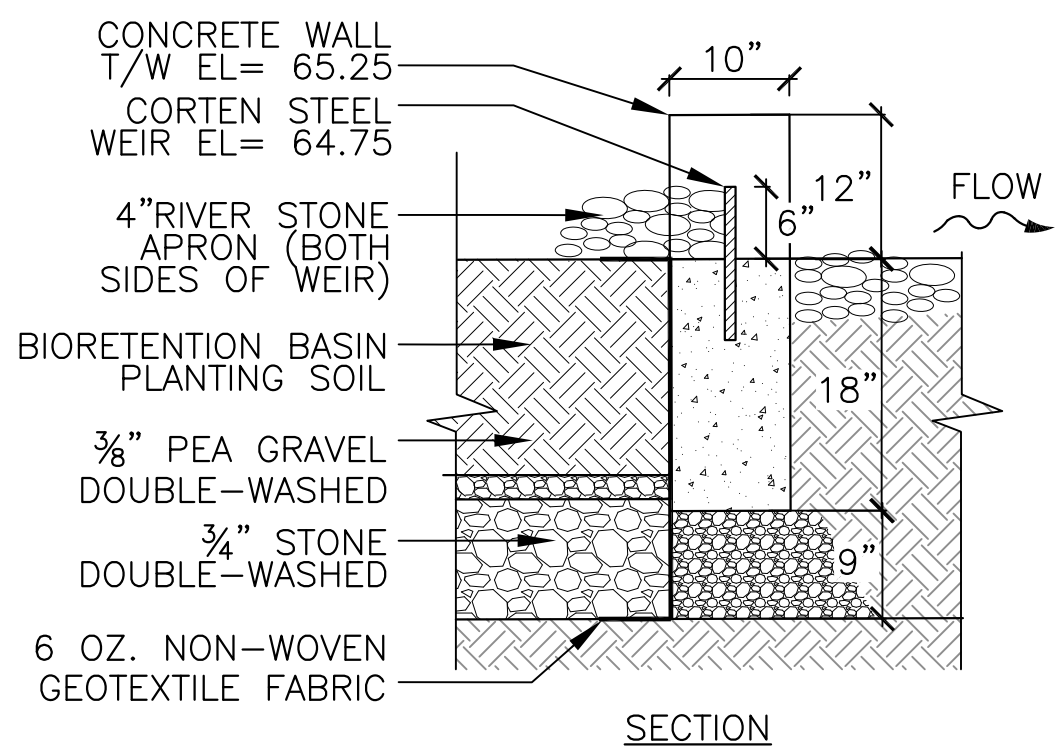
EXPLORATION AREA
ENLARGEMENT PLAN

Sheet No:

L-3

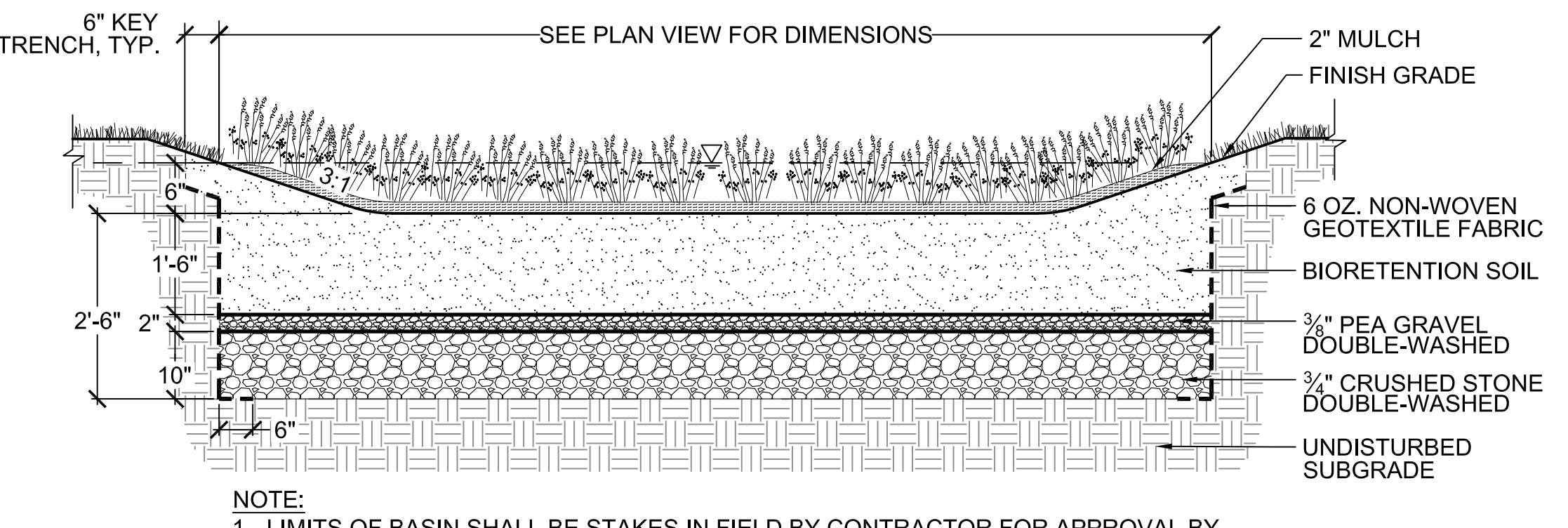
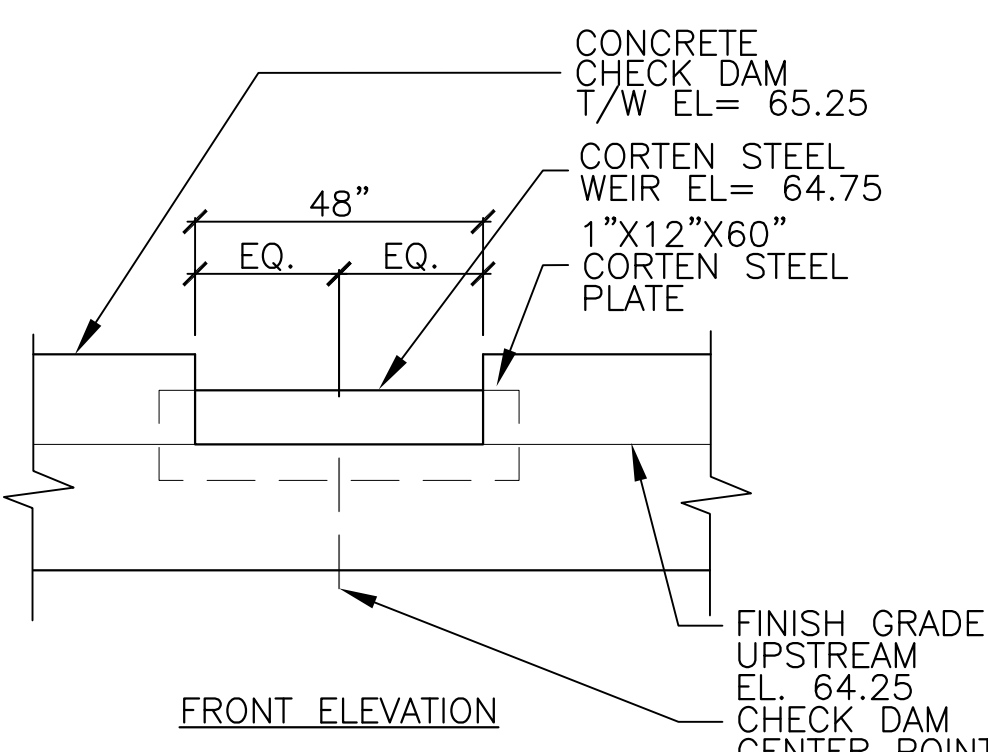


- NOTES:**
- THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE EXISTING CONDITIONS SHOWN ON THESE PLANS IS BASED ON A SURVEY COMBINED WITH AS-BUILT INFORMATION FROM THE PREVIOUS PROJECT PHASE. THIS INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR, PRIOR TO THE START OF CONSTRUCTION, SHALL THOROUGHLY REVIEW THE EXISTING CONDITIONS AS THEY RELATE TO THESE SITE PLAN DRAWINGS AND NOTIFY LANDSCAPE ARCHITECT OF ANY DISCREPANCIES PRIOR TO THE START OF CONSTRUCTION.
 - COORDINATE ALL GRADING AND PIPED CONNECTIONS WITH GRADING & DRAINAGE PLAN L-2.
 - CONTRACTOR SHALL STAKE LIMITS OF BIORETENTION BASIN AND SWALE IN FIELD FOR APPROVAL BY LANDSCAPE ARCHITECT PRIOR TO START OF CONSTRUCTION.
 - SEE SHEET L-10 FOR PLANT SCHEDULE.
 - CONTRACTOR SHALL SUPPLY ALL PLANT MATERIAL IN QUANTITIES SUFFICIENT TO COMPLETE THE PLANTING PLAN AS SHOWN ON DRAWINGS.
 - NO PLANT MATERIAL SHALL BE PLANTED BEFORE ACCEPTANCE OF FINAL GRADING BY LANDSCAPE ARCHITECT.
 - WATERING OF INSTALLED PLANTS SHALL OCCUR WITHIN 24 HOURS OF THE FIRST DAY OF PLANTING OR SEEDING AND CONTINUE AS OUTLINED IN THE CONTRACT DOCUMENTS.



5 CHECK DAM

SCALE: NTS

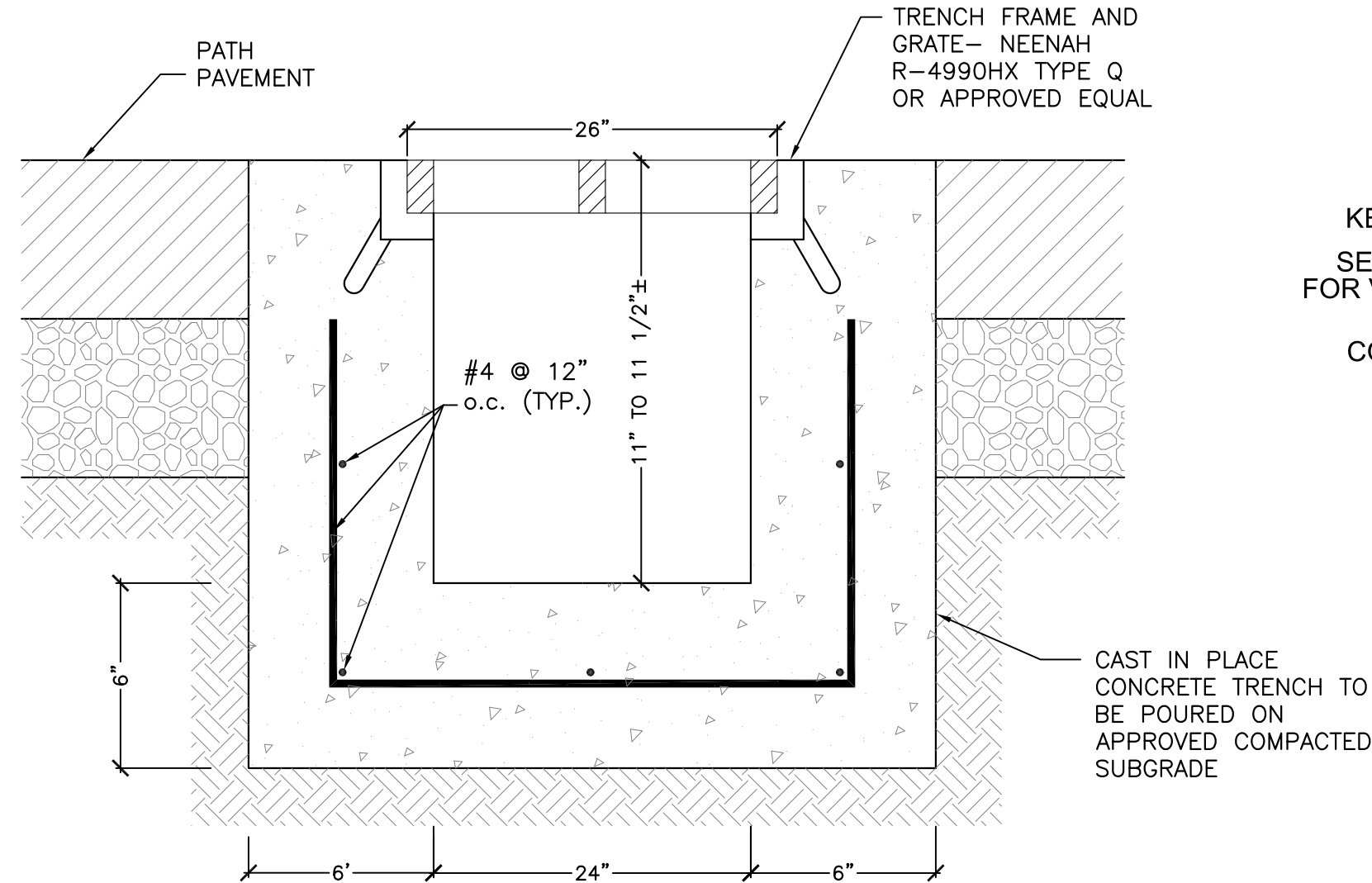


1 BIORETENTION BASIN

SCALE: NTS

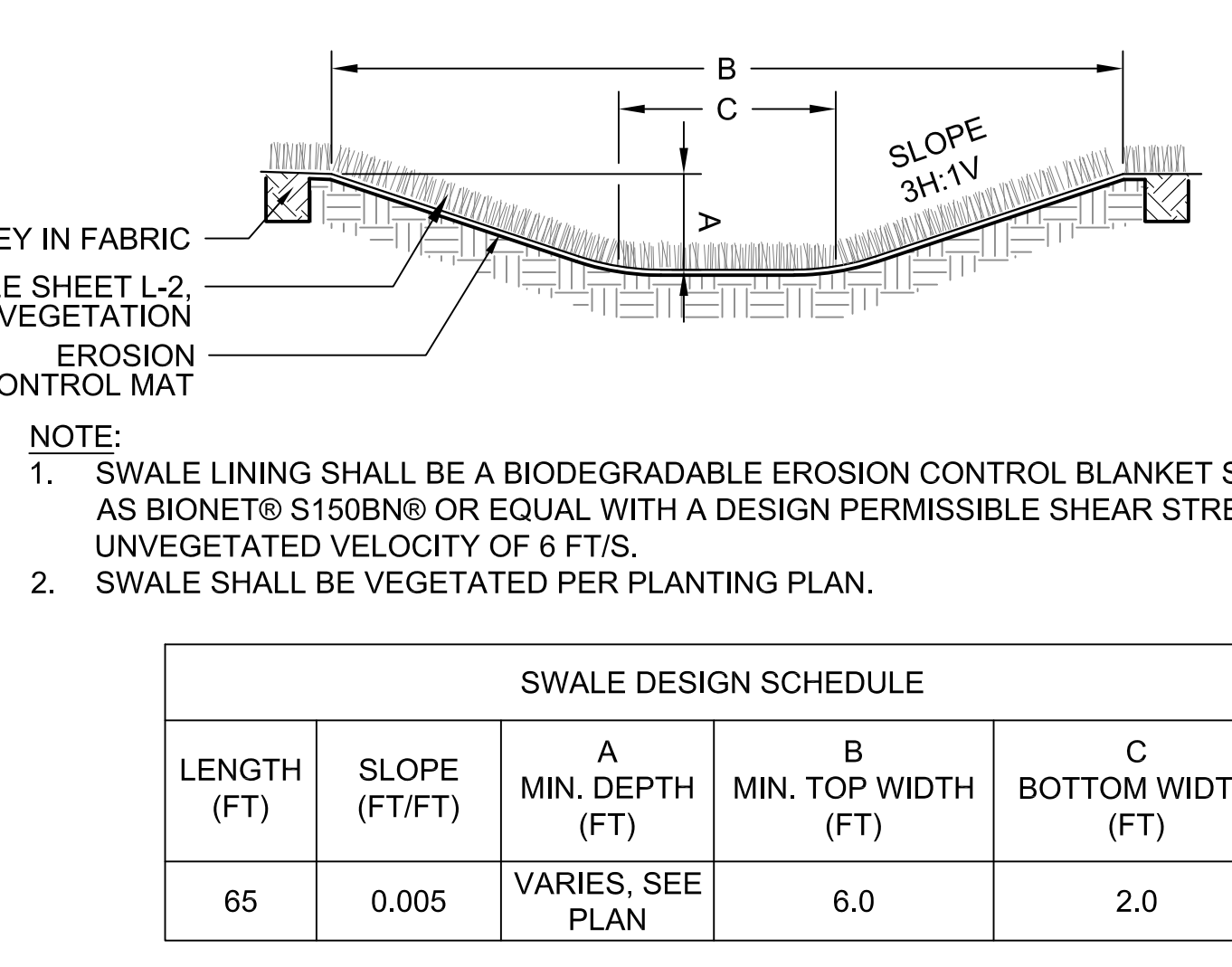
3 TRENCH DRAIN AND GRATE

SCALE: NTS



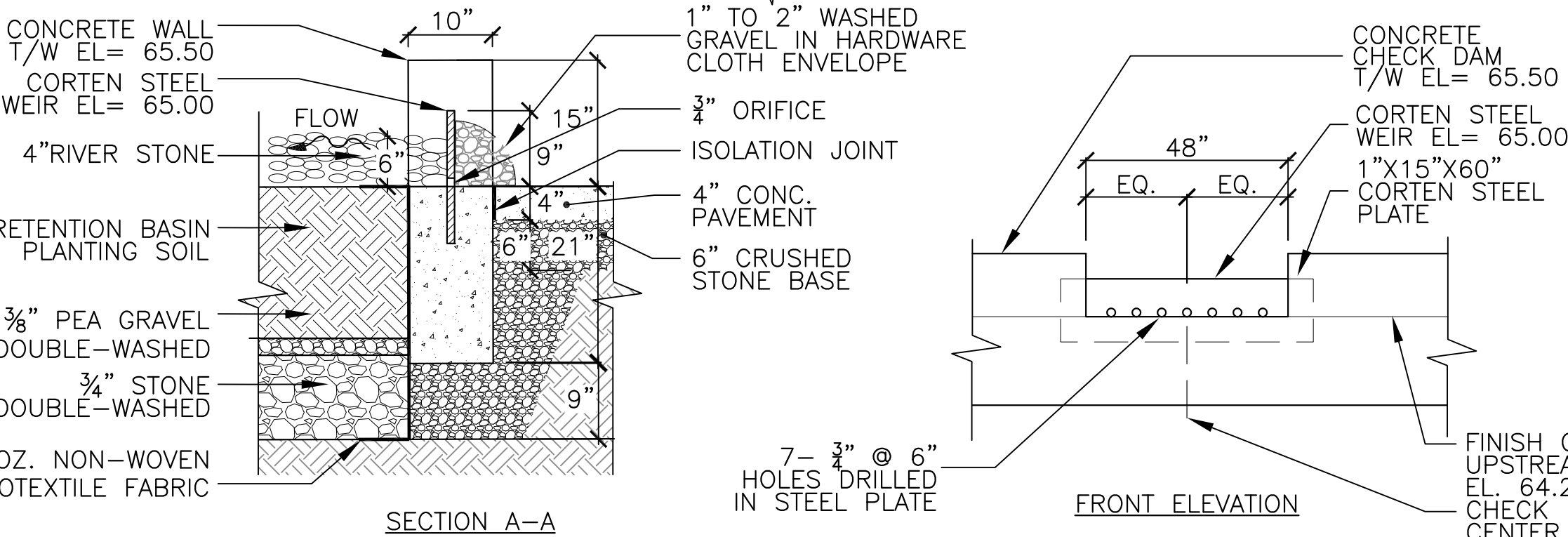
2 CONVEYANCE SWALE

SCALE: NTS



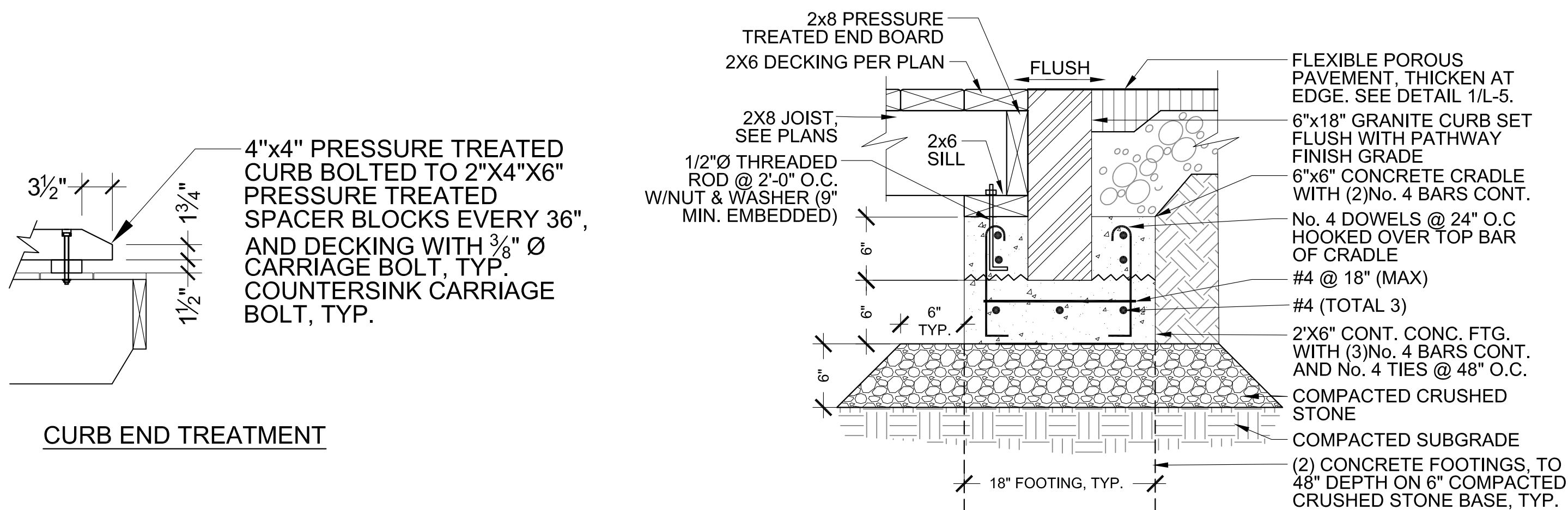
4 SEDIMENT FOREBAY

SCALE: NTS



- LEGEND**
- LIMIT OF WORK
 - PROPERTY LINE
 - 25' RIVERFRONT BUFFER
 - 50' RIVERFRONT BUFFER
 - 100' RIVERFRONT BUFFER
 - EXISTING CONTOURS
 - PROPOSED CONTOUR
 - EXISTING SPOT ELEVATION
 - EXISTING INTERPOLATED SPOT GRADE. CONTRACTOR TO VERIFY IN FIELD
 - PROPOSED SPOT GRADE
 - PROPOSED SLOPE

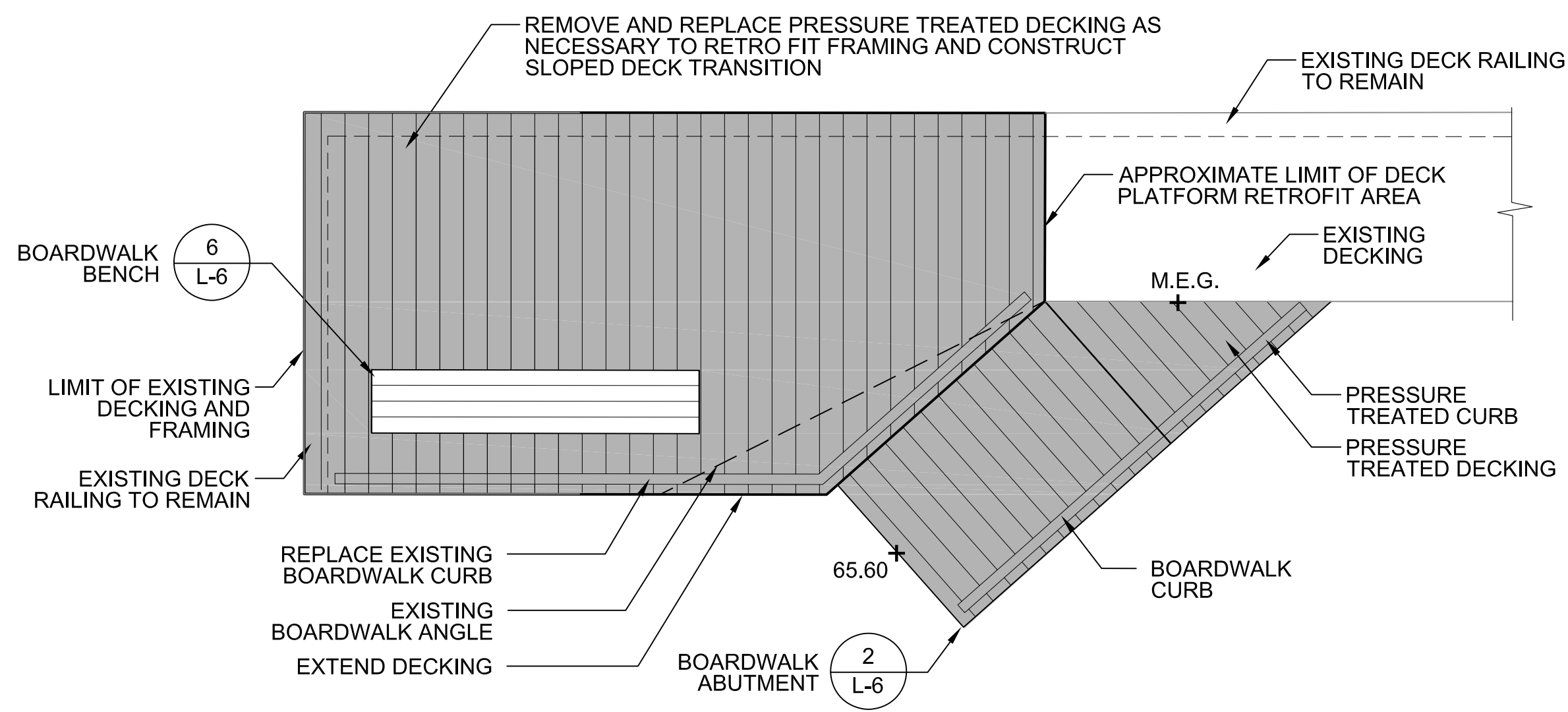
BIORETENTION DATA		
DESCRIPTION	ELEVATION	AREA (SF)
TOP OF BERM	65.25	1100
WATER SURFACE	64.75	910
BIORETENTION SURFACE	64.25	700
BOTTOM OF STONE LAYER	61.75	700



2 BOARDWALK ABUTMENT

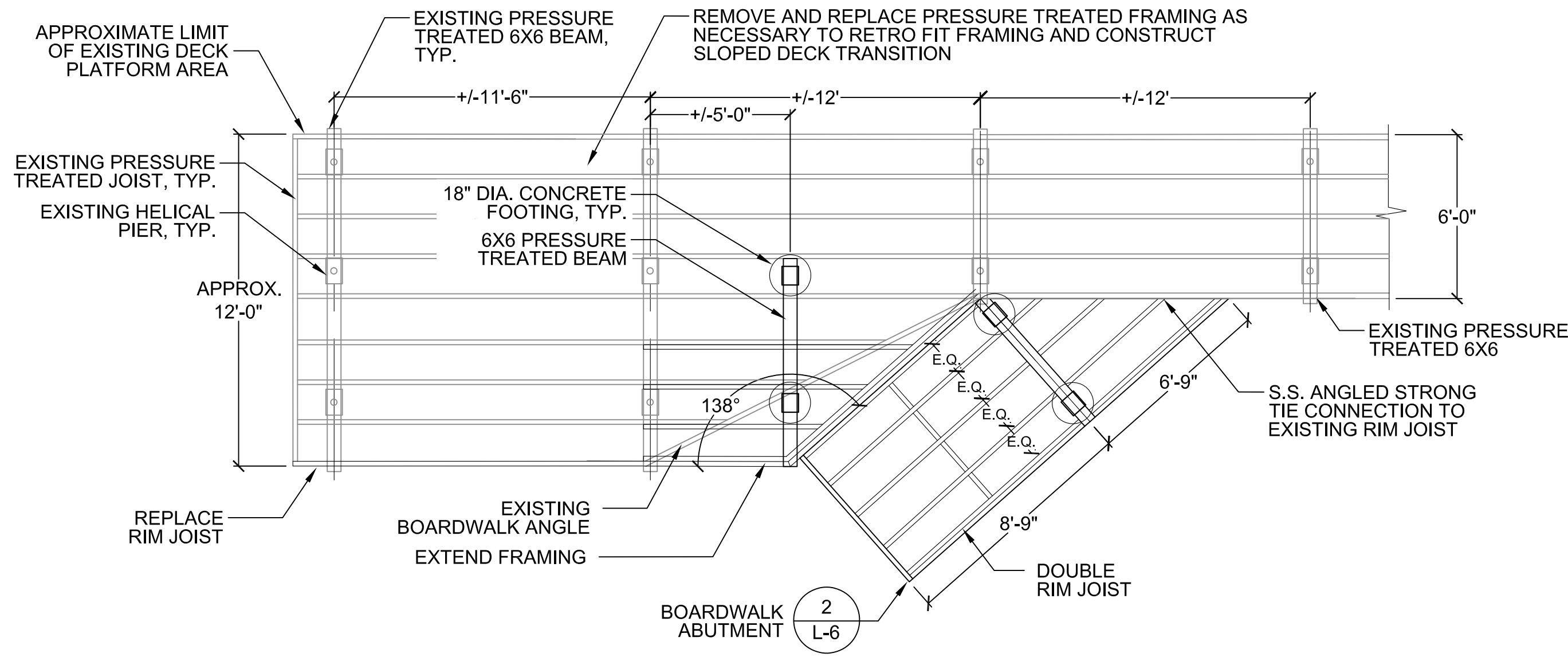
SCALE: NTS

- GENERAL NOTES:**
- CAST-IN-PLACE CONCRETE WORK SHALL CONFORM TO THE LATEST AMERICAN CONCRETE INSTITUTE (ACI) CODES AND STANDARDS, INCLUDING BUT NOT LIMITED TO, ACI 301, 315, AND 318. COLD WEATHER CONCRETING AS DEFINED BY ACI, SHALL BE IN ACCORDANCE WITH ACI 306R.
 - CONCRETE MIX SHALL BE SUBMITTED TO ENGINEER FOR REVIEW AND APPROVAL PRIOR TO PLACEMENT. PER ACI-318, AT A MINIMUM CONCRETE SHALL MEET THE FOLLOWING CRITERIA:
 - MAXIMUM WATER TO CEMENT RATIO: 0.45
 - MINIMUM COMPRESSIVE STRENGTH: 4,500 PSI
 - AIR CONTENT PERCENT*: 5.0 %
 *ASSUMING NOMINAL MAXIMUM AGGREGATE SIZE OF 3/4". ADJUST AIR CONTENT PER ACI TABLE 4.4.1 IS VARIES
 - ALL REINFORCING STEEL SHALL BE CONTINUOUS NEW DOMESTIC DEFORMED BILLET STEEL CONFORMING TO ASTM A615 GRADE 60. EMBEDDED ANCHOR BOLTS SHALL CONFORM TO ASTM F1554 GR. 36.
 - GRANITE CURB SHALL CONFORM TO THE REQUIREMENTS OF MASSDOT STANDARD SPECIFICATION FOR HIGHWAYS AND BRIDGES M9.04.1 TYPE VA5. EACH CURB PIECE FOR EACH ABUTMENT SHALL BE OF SUFFICIENT LENGTH TO COVER THE ENTIRE WIDTH OF THE ELEVATED WALKWAY. ONLY 1 PIECE OF GRANITE SHALL BE USED FOR EACH ELEVATED WALKWAY ABUTMENT.
 - ALL TIMBER HARDWARE AND FASTENERS SHALL BE STAINLESS STEEL WHERE EXPOSED. JOIST HANGERS AND HARDWARE SHALL BE GALVANIZED. PROVIDE CONCEALED FLANGE JOIST HANGERS WHERE REQUIRED.
 - PRESSURE TREATED 2X8 BLOCKING SHALL BE INSTALLED AS REQUIRED FOR INSTALLATION OF RAILING POSTS AND TYPICALLY IN A STAGGERED PATTERN AT THE MID-SPAN OF THE JOIST SPAN.
 - 4X4 RAILING POST LOCATION MAY BE ADJUSTED AS REQUIRED TO ALLOW FOR INSTALLATION OF BLOCKING AND CONNECTION. RAILING POST SPACING SHALL NOT EXCEED 5'-0" O.C.
 - DESIGN SERVICE AND STRENGTH LOADING IS PROVIDED IN TABLE 1 AND TABLE 2 OF DETAIL 1 ON THIS SHEET FOR THE DESIGN OF THE HELICAL ANCHORS.
 - AXIAL AND HORIZONTAL LOADING SHALL ACT CONCURRENTLY FOR EACH LOAD CASE WHERE APPLICABLE.
 - DECKING AND CURBS TO BE IPE AS SPECIFIED.
 - JOISTS AND BEAMS TO BE PRESSURE TREATED.
 - ALL WOOD DIMENSIONS ARE NOMINAL.
 - CONNECTORS TO BE GALVANIZED SIMPSON-TIE OR APPROVED EQUAL.



2 BOARDWALK FRAMING PLAN

SCALE: NTS



1 BOARDWALK DECKING PLAN

SCALE: NTS

1 BOARDWALK STRUCTURE

SCALE: NTS

Client/Owner:



Town of Arlington
422 Summer Street, Arlington, MA 02474

HATCH

27 Congress Street, Salem, MA 01970
tel. 978-740-0096 www.hatch.com

Stamp:



Project:

**WELLINGTON PARK & MILL BROOK CORRIDOR
REVITALIZATION PROJECT: PHASE 3**

WELLINGTON PARK - ARLINGTON, MA

75% CONSTRUCTION DOCUMENTS

Project Number: 00205072-00
Hatch Project Number: H-362472
Date: September 17, 2020
Drawn By: AK, AG
Designed By: AK
Reviewed By: DB
Scale: As shown

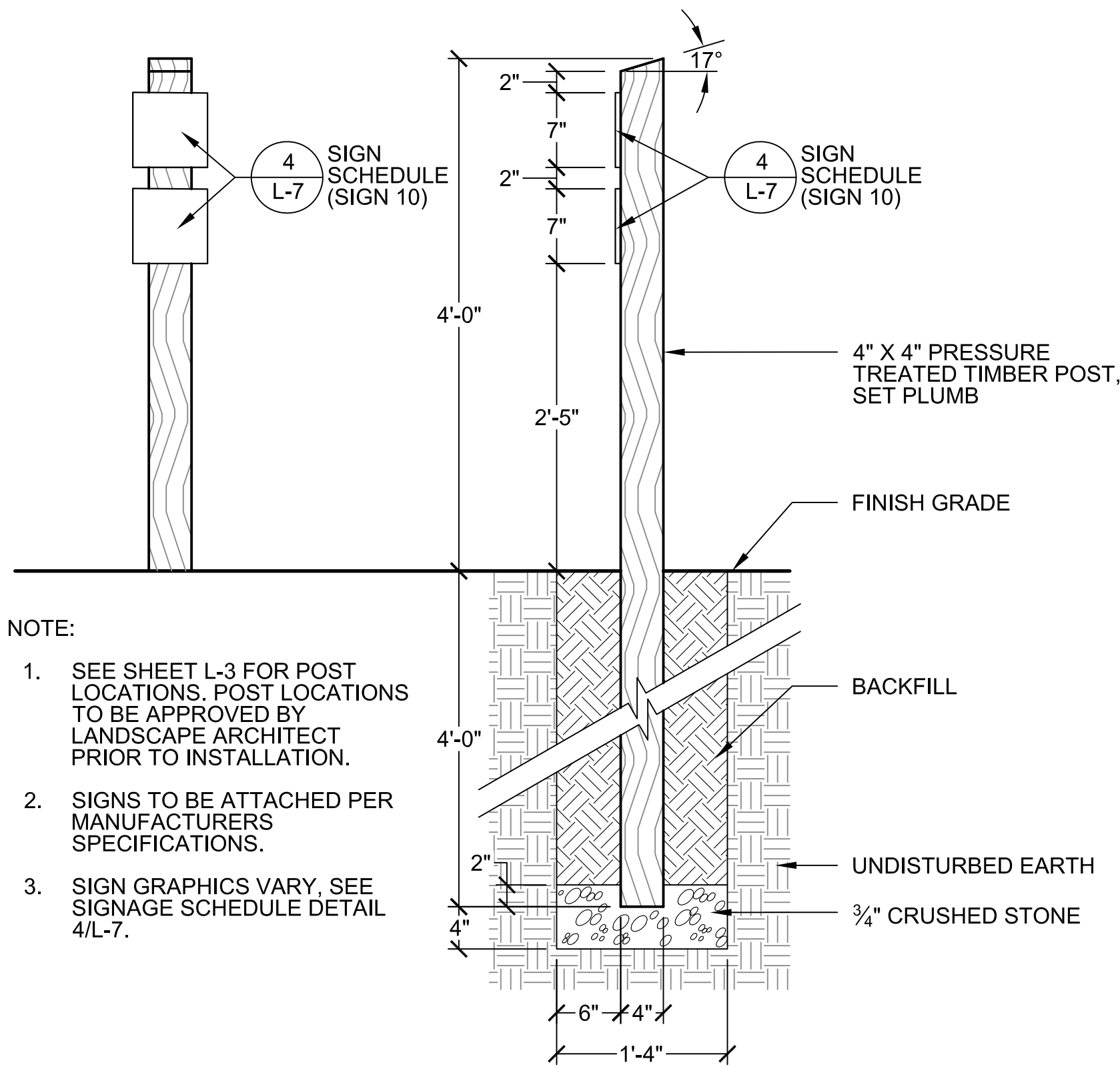
Revisions
Number: Description: Date:

Sheet Title:

**BOARDWALK
ENLARGEMENT PLAN
AND DETAILS**

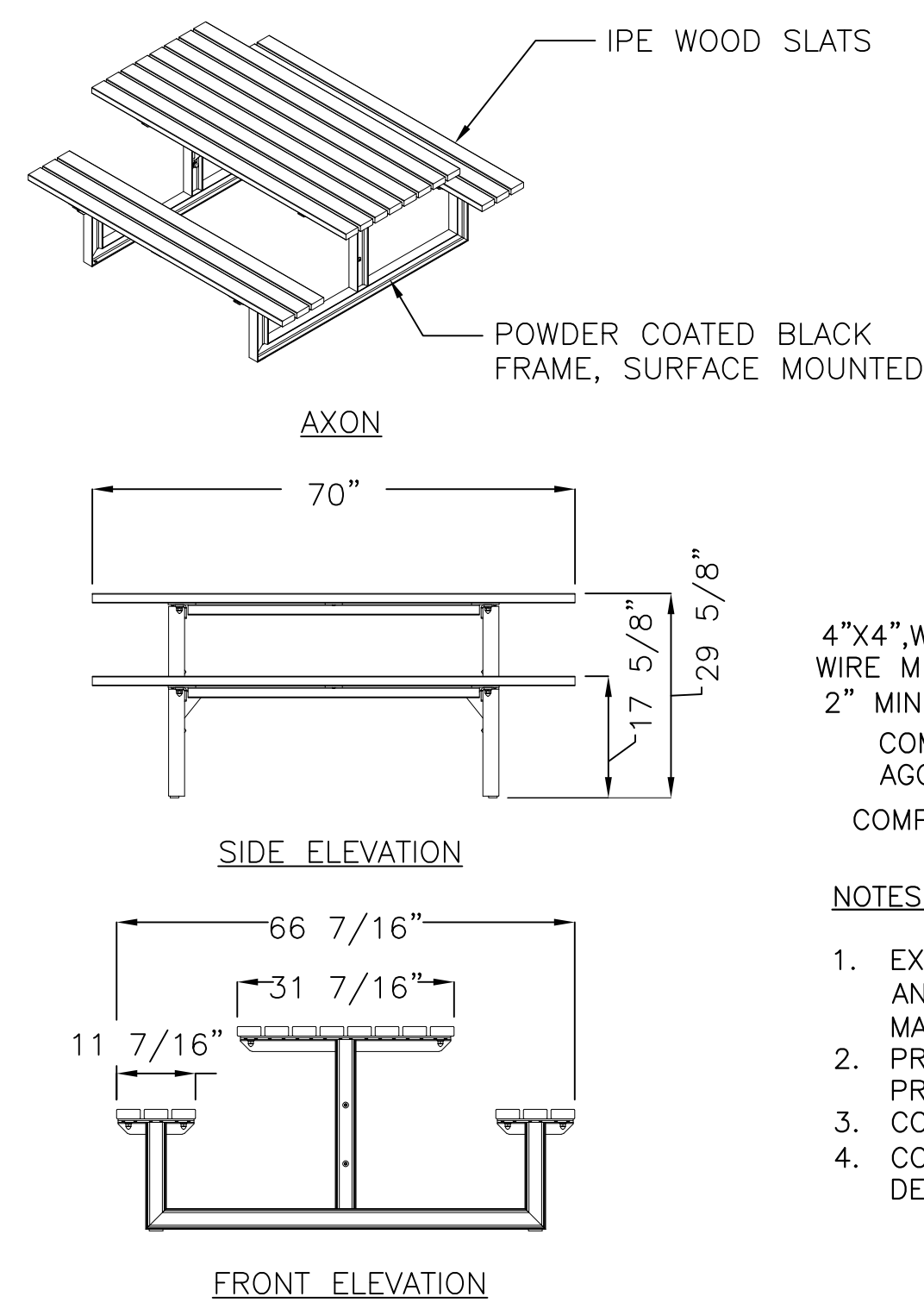
Sheet No:

L-5



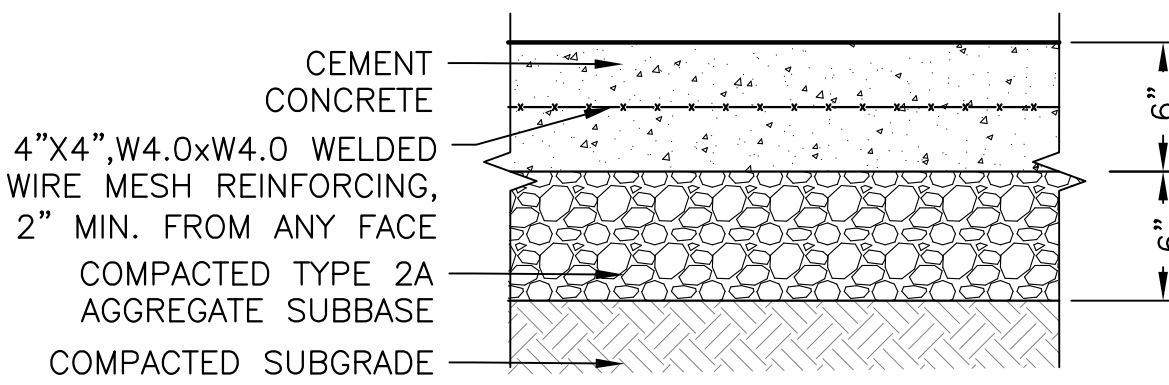
8 WAYFINDING SIGNAGE

SCALE: NTS

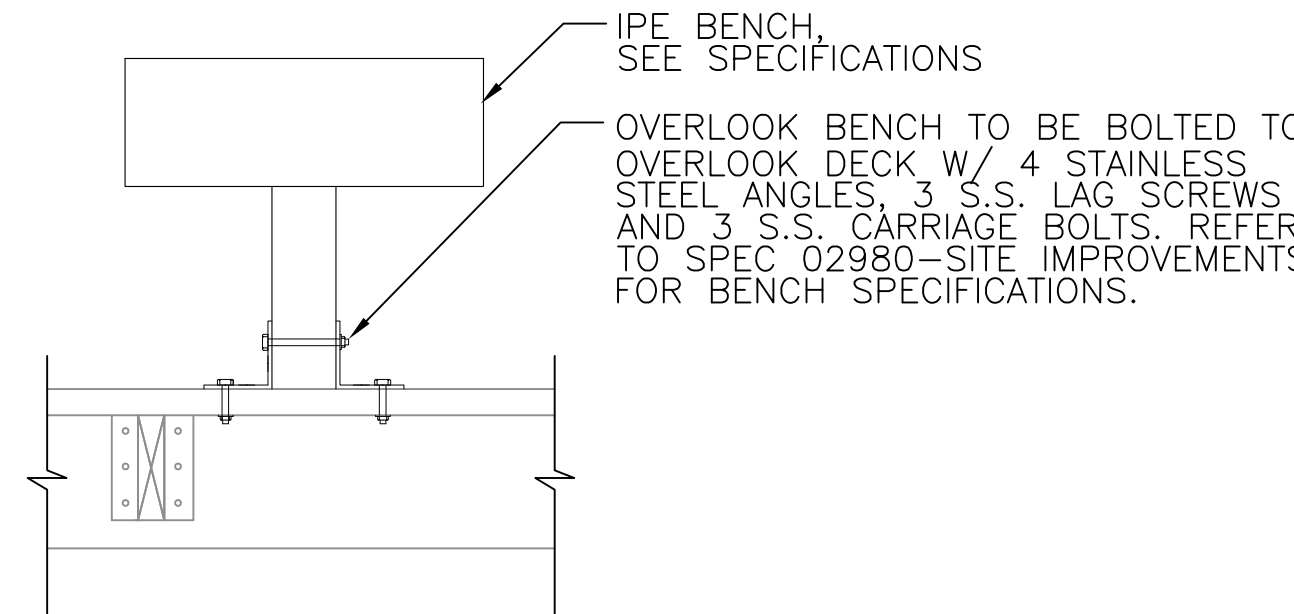


6 PICNIC TABLE WITH CONCRETE PAD

SCALE: NTS

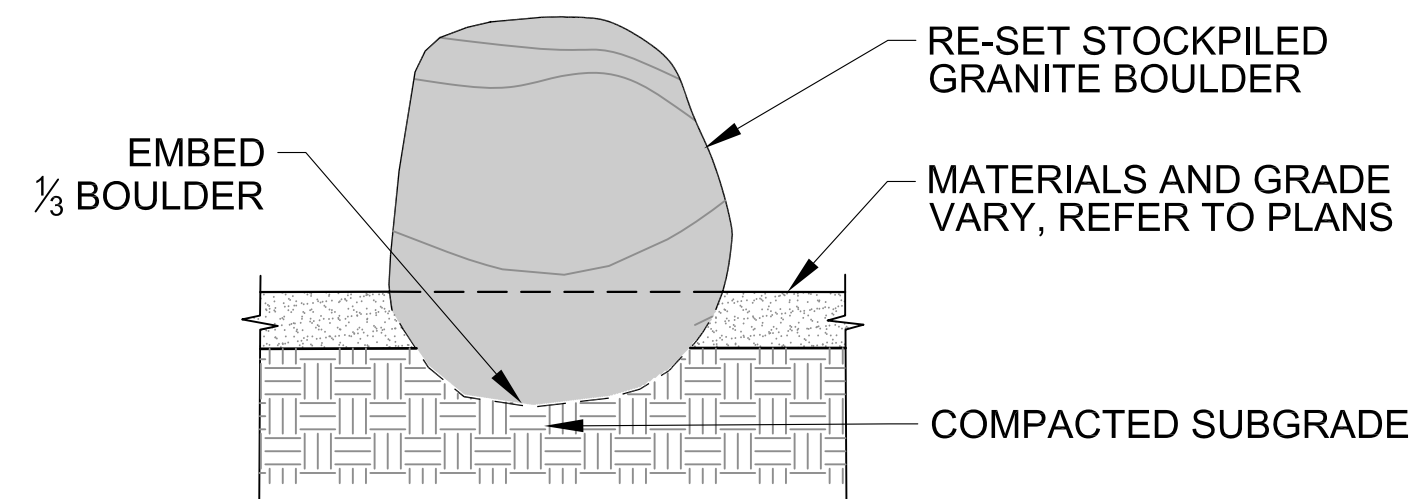


- NOTES:
- EXPANSION JOINT SHALL BE USED WHENEVER HORIZONTAL CONCRETE AND/OR OTHER PAVING SURFACES MEET VERTICAL CONCRETE AND/OR MASONRY SURFACES.
 - PROVIDE EXPANSION JOINT AT MIN. 20 FT. O.C. U.N.O WITH PRE-FORMED JOINT FILLER.
 - CONCRETE SHALL BE CLASS A 4,000 PSI.
 - CONCRETE BROOM FINISH WITH TOOLED CONTROL JOINT ¾" X ¼" DEPTH OF CONCRETE.



5 BOARDWALK BENCH

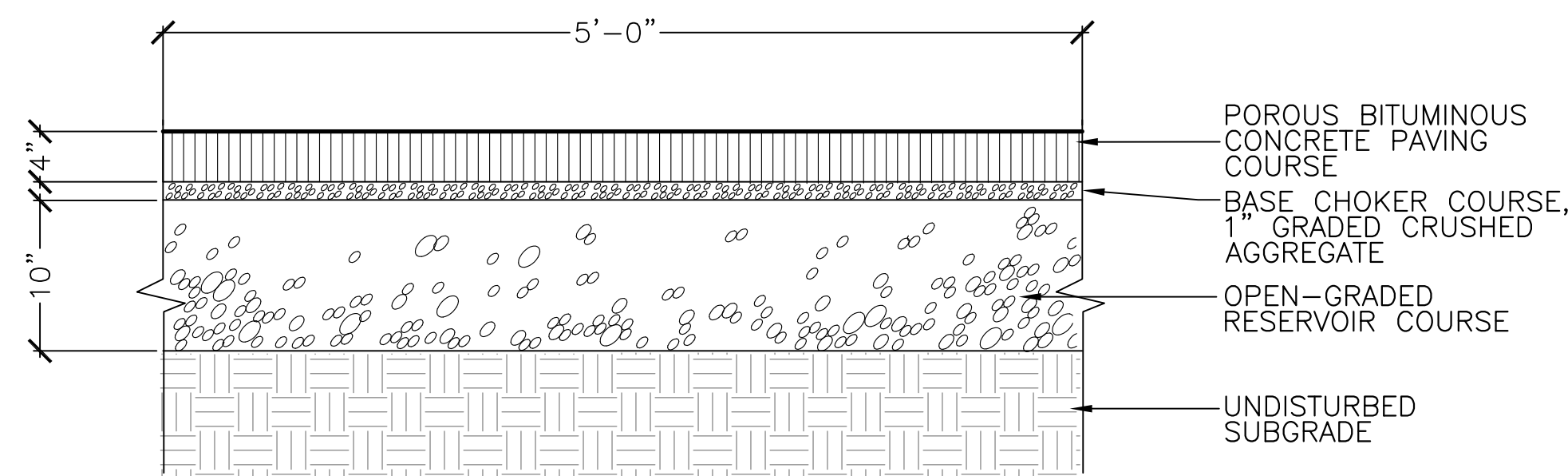
SCALE: NTS



- NOTES:
- RE-SET STOCKPILED GRANITE BOULDERS TO BE PLACED AT DIRECTION OF LANDSCAPE ARCHITECT.
 - EMBEDDED BOULDER DEPTH SHALL BE DETERMINED BY LANDSCAPE ARCHITECT IN FIELD.

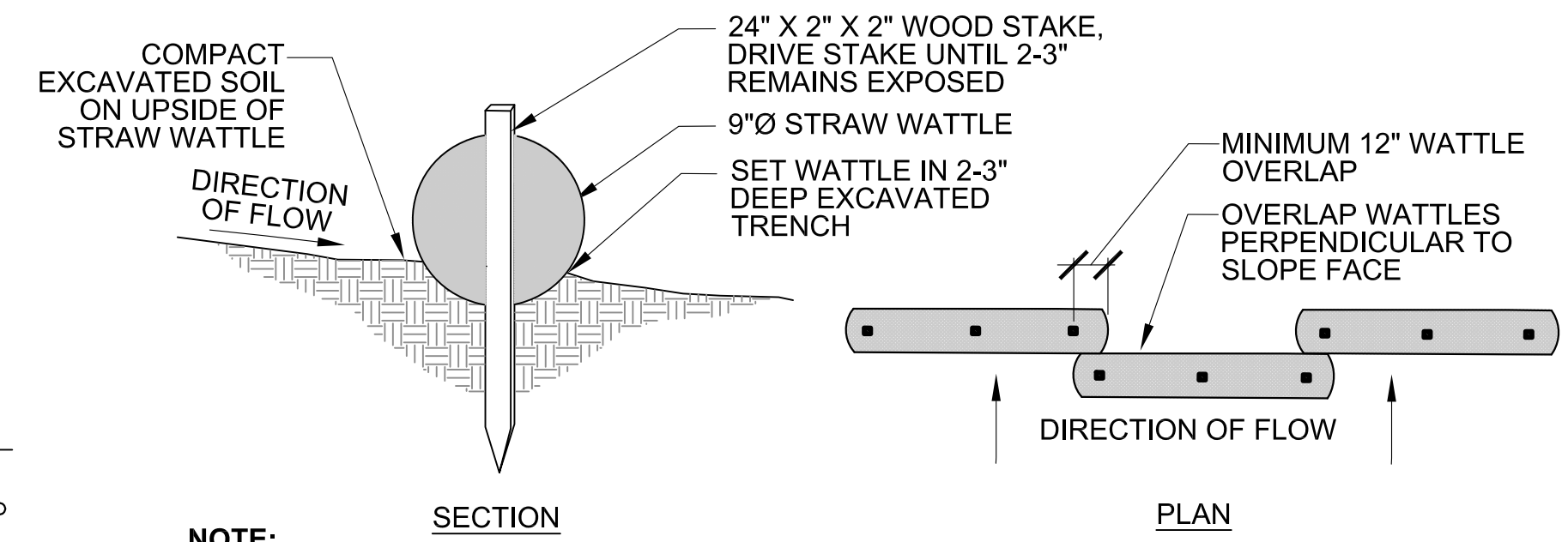
4 LANDSCAPE BOULDER

SCALE: NTS



3 POROUS BITUMINOUS CONCRETE PAVING

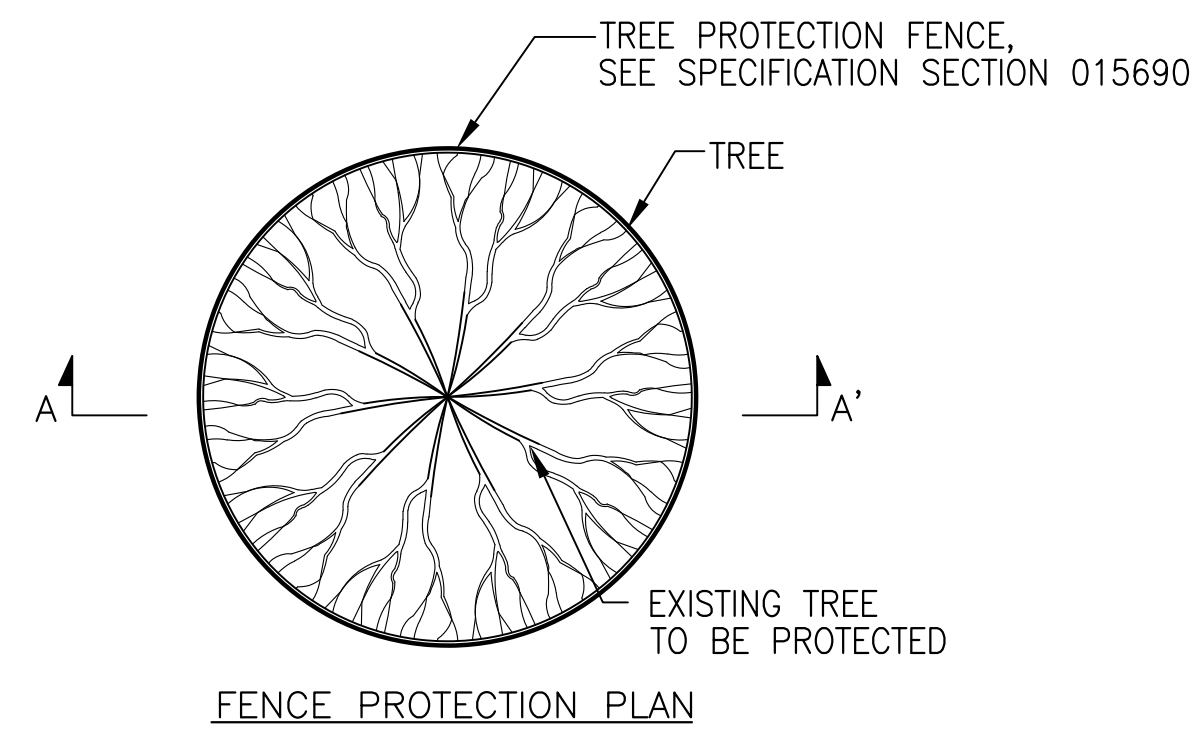
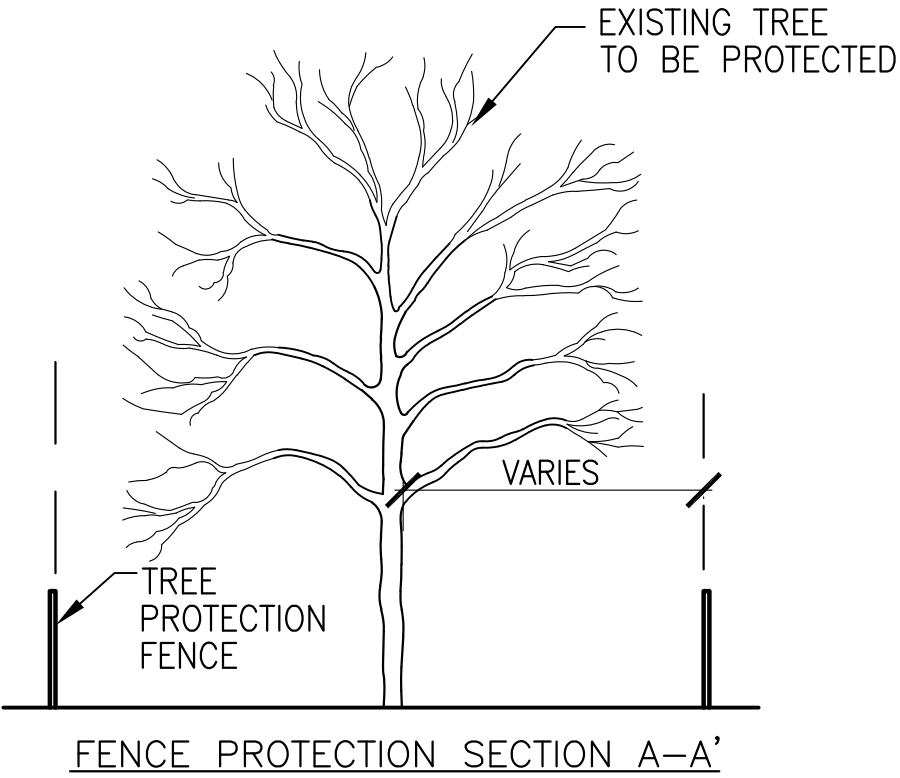
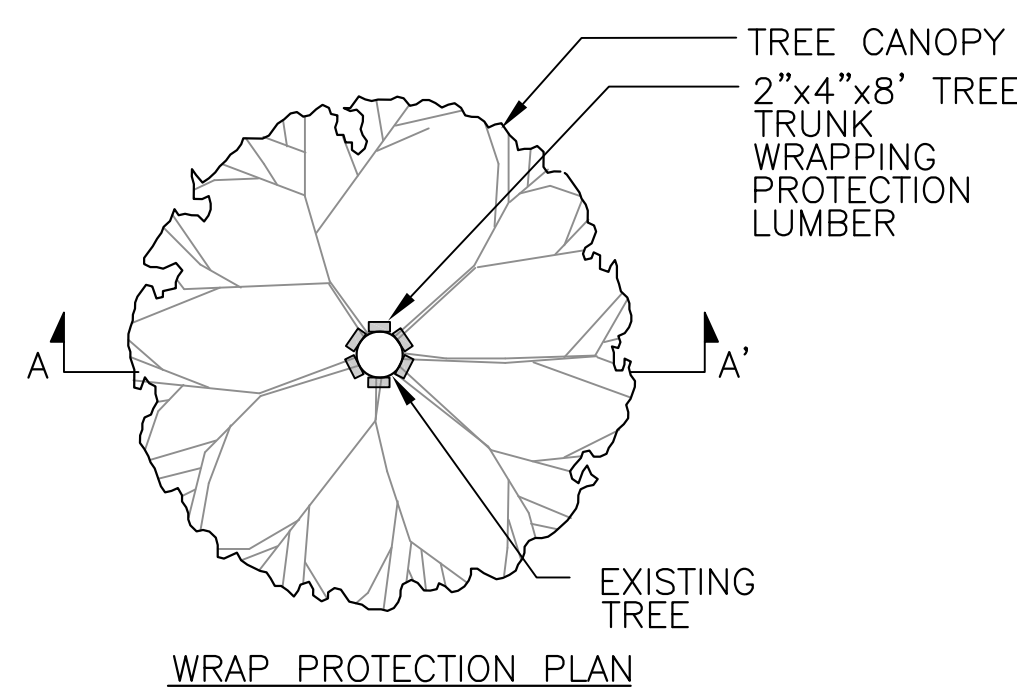
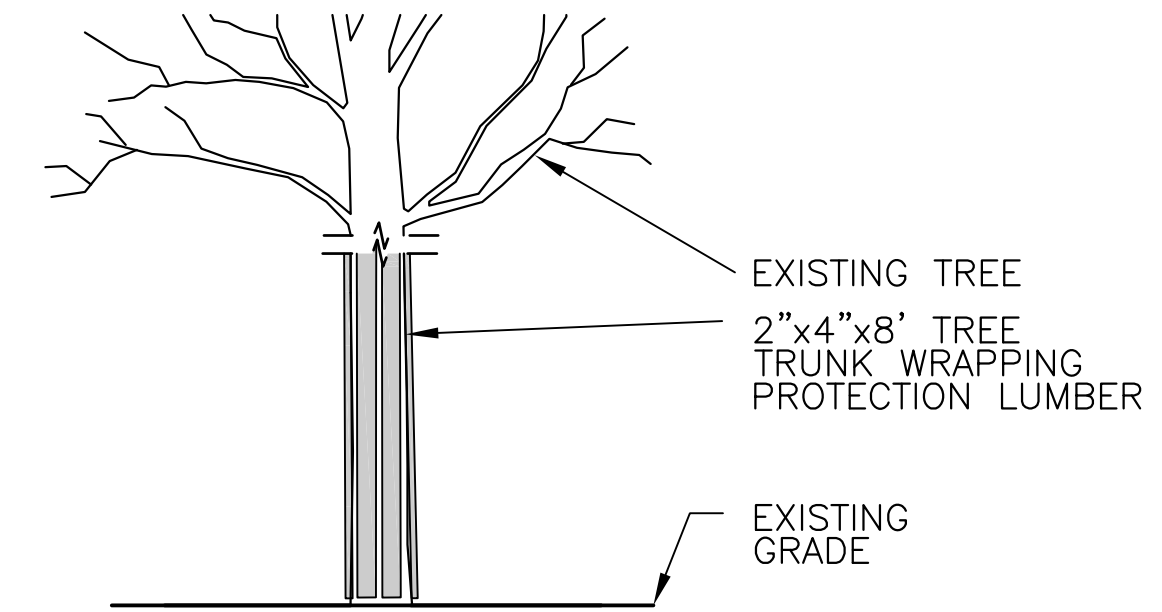
SCALE: NTS



- NOTE:
- INSTALL STAKE PERPENDICULAR TO SLOPE FACE.

2 STRAW WATTLE

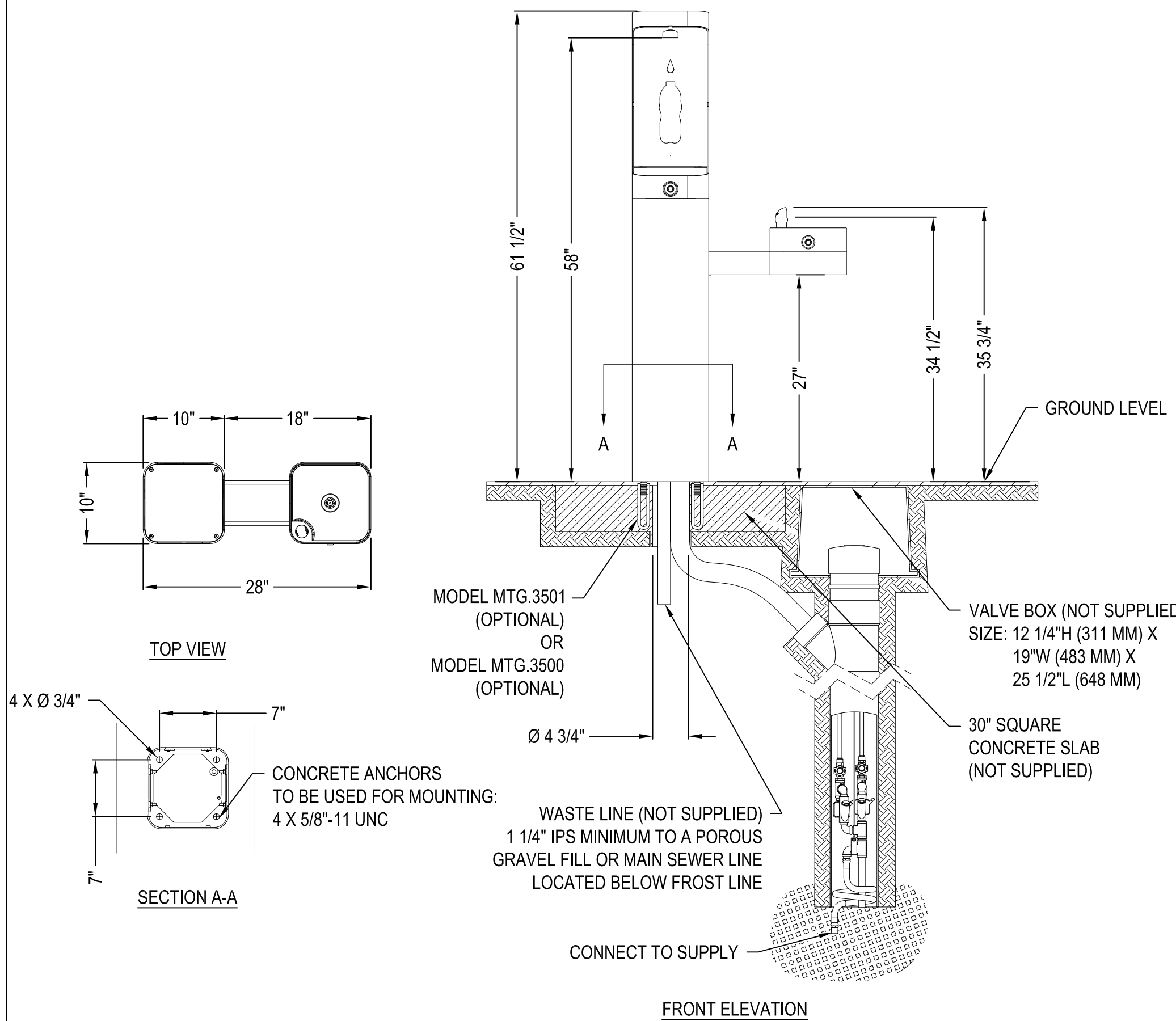
SCALE: NTS



- NOTE:
- ALL TREE PROTECTION SHALL BE INSTALLED PRIOR TO ANY CONSTRUCTION ACTIVITIES AND MAINTAINED IN GOOD CONDITION THROUGHOUT THE CONSTRUCTION PERIOD.

1 TREE PROTECTION

SCALE: NTS



- MANUFACTURER NOTES:
- FREEZE RESISTANT BOTTLE FILLER DRINKING FOUNTAIN SHALL BE INSTALLED PER MANUFACTURERS INSTRUCTIONS.
 - CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR APPROVAL PRIOR TO PROCUREMENT.

7 DRINKING FOUNTAIN WITH BOTTLE FILLER

SCALE: NTS

Client/Owner:

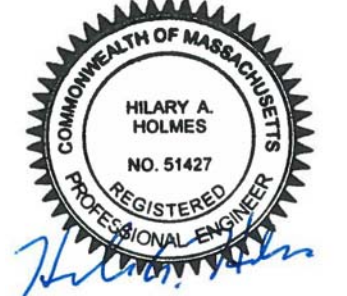


Town of Arlington
422 Summer Street, Arlington, MA 02474

HATCH

27 Congress Street, Salem, MA 01970
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Stamp:



Project:

WELLINGTON PARK & MILL BROOK CORRIDOR
REVITALIZATION PROJECT: PHASE 3
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Project Number: 00205072-00
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Date: September 17, 2020
Drawn By: AK, AG
Designed By:
Reviewed By: DB
Scale: As shown

Revisions
Number: Description: Date:

Sheet Title:

SITE DETAILS

Sheet No:

L-6

Memo

Date: September 29, 2020
To: Town of Arlington Conservation Commission
From: Andrew Keel, Duke Bitsko – Hatch
Project: Wellington Park and Mill Brook Corridor Revitalization – Phase 3
 DEP No. 091-0324
Subject: Design Revisions per Conservation Commission Request from 9/17 NOI Hearing

The intent of this memo is to summarize design revisions that have been incorporated into the 75% drawing set at the request of the Conservation Commission raised during the 9/17 hearing. Also included is a response to the Town Engineering Department's comments and questions.

1. Design Revisions (in italics):

- 1.1 Review size of river stone at bioretention basin weirs.
Size of river stone at weir/biobasin increased from 4" to 6" diameter and layer of 3/4" crushed stone added below river stone with non-woven geotextile filter fabric.
- 1.2 Review alternatives for Cor-ten steel weir based on salt corrosion and park aesthetics.
Hatch proposes to utilize a composite wood material with removable slats that have the ability to be raised or lowered based on future storm events.
- 1.3 Request for more tree planting, specifically canopy trees along brook for shade.
Hatch is increasing the number of shade trees from 8 to 11 and will find appropriate areas along the brook for placement.
- 1.4 Request to evaluate bench location and proximity to floodplain/floodway.
The bench is currently out of the 100-yr flood zone. Option one is to relocate the bench across the path. Option two is to leave the bench in its current location and relocate in the future if flooding becomes an issue.

2. Town Engineering Department Review (Responses in italics):

- 2.1 Proposed excavating and/or resurfacing over/near an MWRA Sewer Easement:
 - 2.1.1 8M Permit (Sewer) may be required for excavation/resurfacing work near this sewer; if Hatch has not already done so, they should contact Kevin McKenna from the MWRA for a plan review and permit as needed
Hatch is actively pursuing the MWRA 8M permit.
 - 2.1.2 The MWRA may not approve of infiltrating water above/near the easement.
The vegetated swale is intended for conveyance purposes only during higher storm events; see response 2.3 below regarding rapid infiltration associated with the bioretention basin.
- 2.2 Drinking Fountain:
 - 2.2.1 Will this still be appropriate to include following COVID?
Hatch actively pursuing answer from Parks and Recreation Department; if not appropriate funds will be allocated towards extending the plant maintenance and guarantee period, which includes invasive plant monitoring and removals.
 - 2.2.2 Who is "By Others"? Additional permitting/metering/etc. will be required by the DPW.
DPW would be responsible for installation of waterline and connection (cost exceeds project budget).

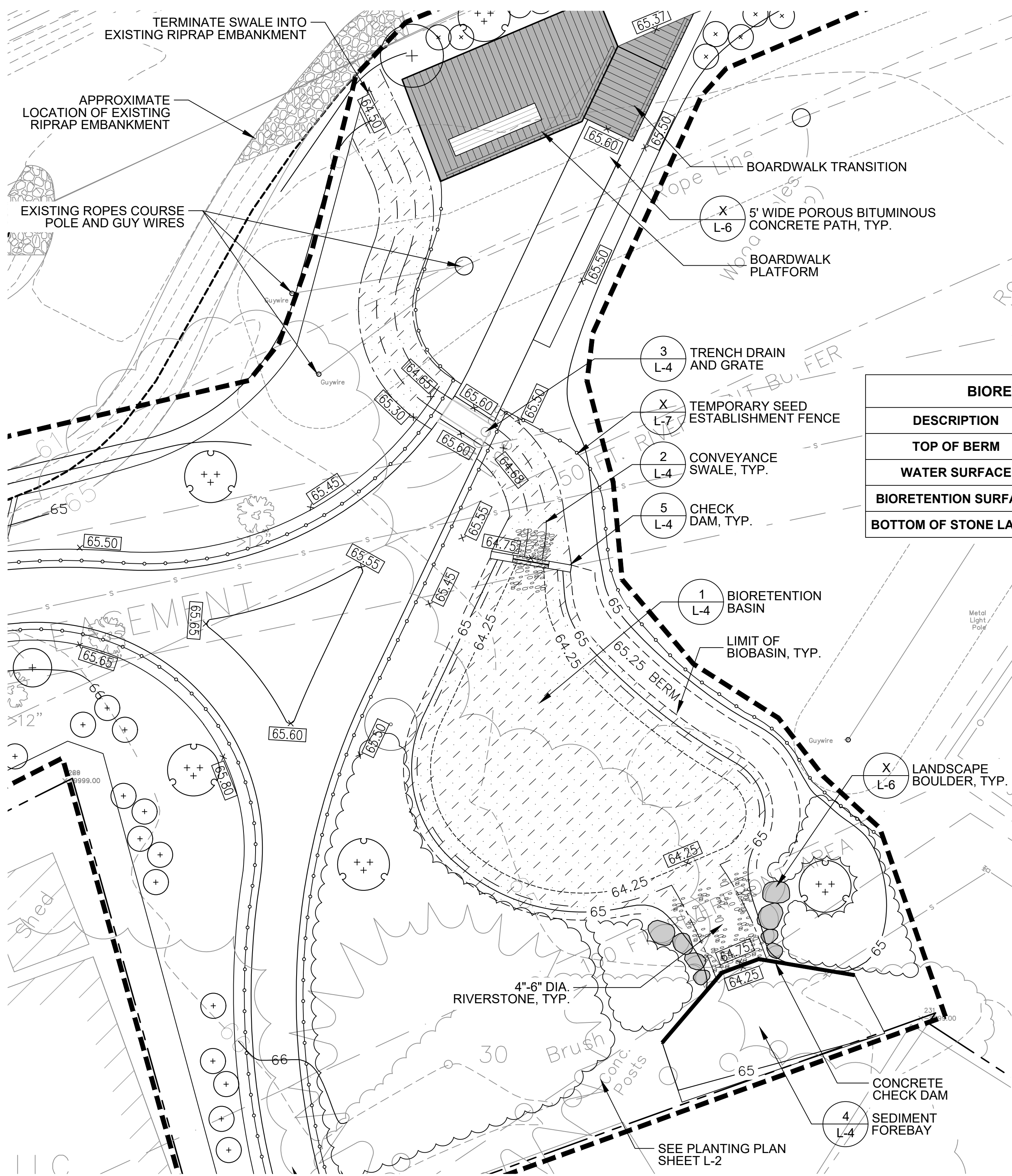
2.3 Standing Water in Bioretention Basin: any concern regarding mosquitoes (HHS)?

No. Based on 2018 test pit soils investigation (from Phase 2 project) soils indicate water will drain from basin in approximately 6 hours and mosquito hatching time in standing water is 2-3 days.

2.4 4" Riverstone in Forebay: Significant volume of stormwater builds up on Prentiss. Have the flows during heavy storms been observed/considered to ensure 4" stone will be able to withstand flows at the forebay?

River stone size has been increased to 6" diameter.

Attachment: Sheet L-4 Bioretention Basin and Swale Enlargement Plan.

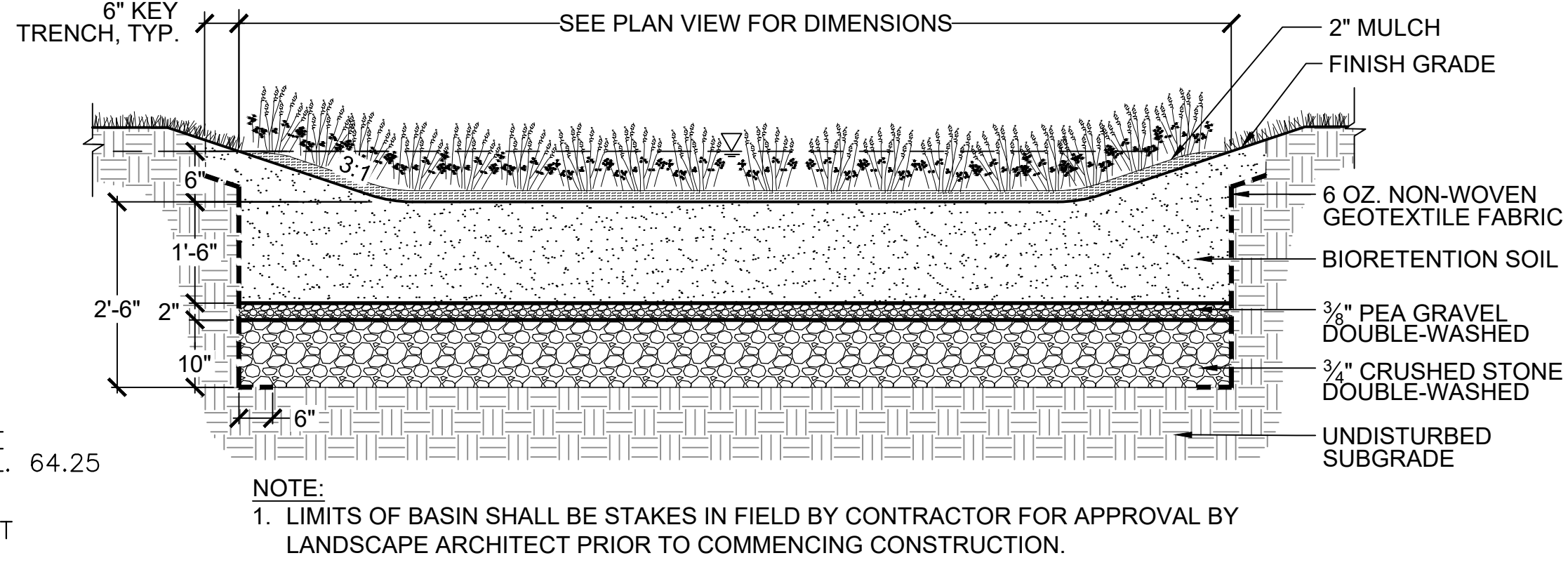
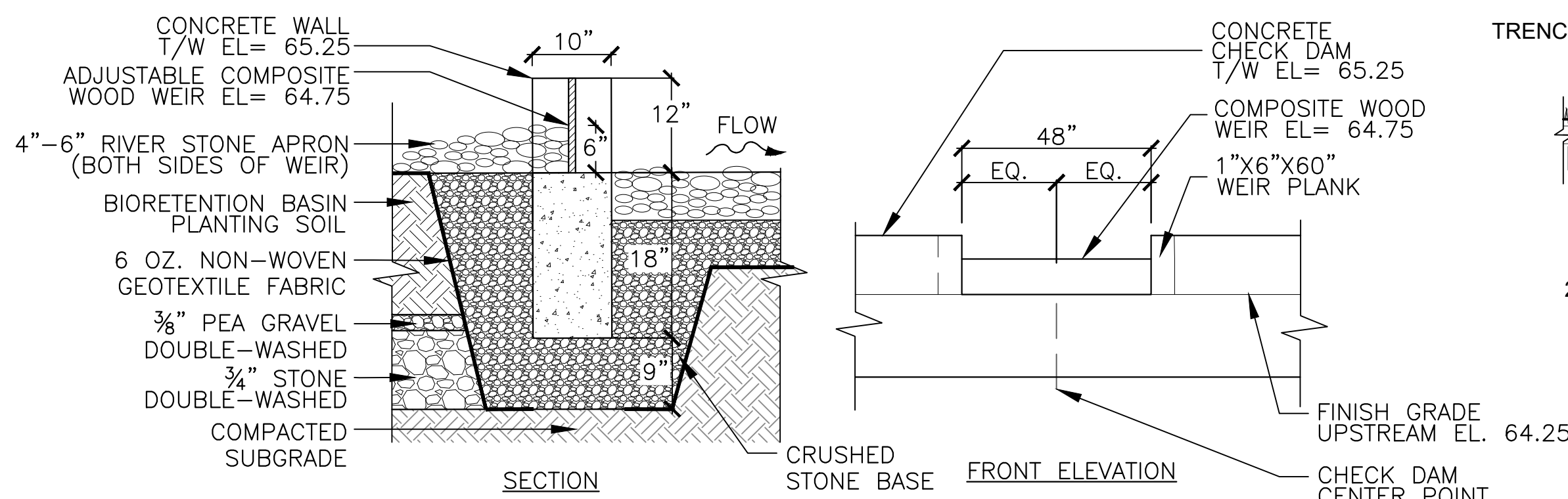
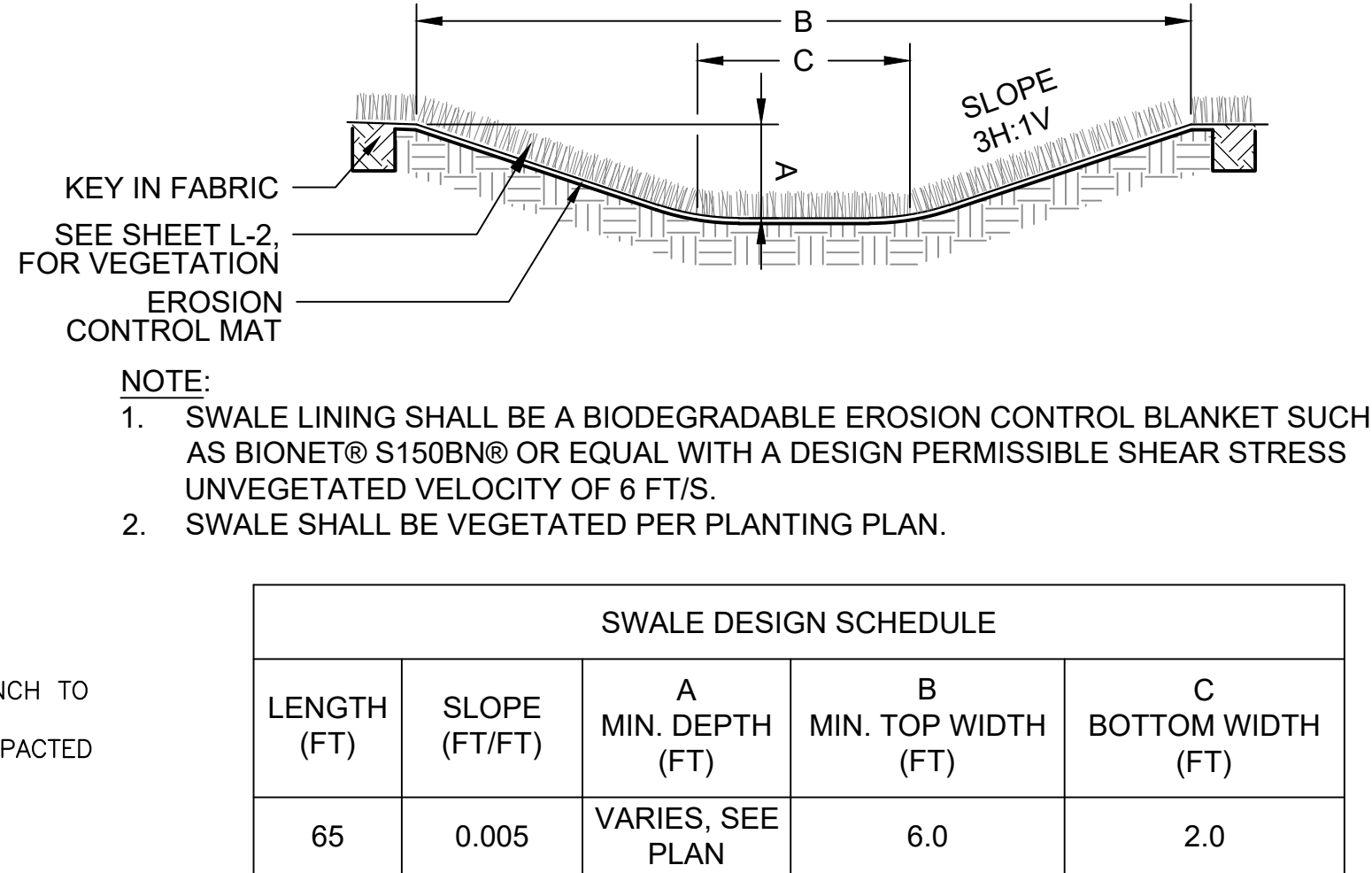
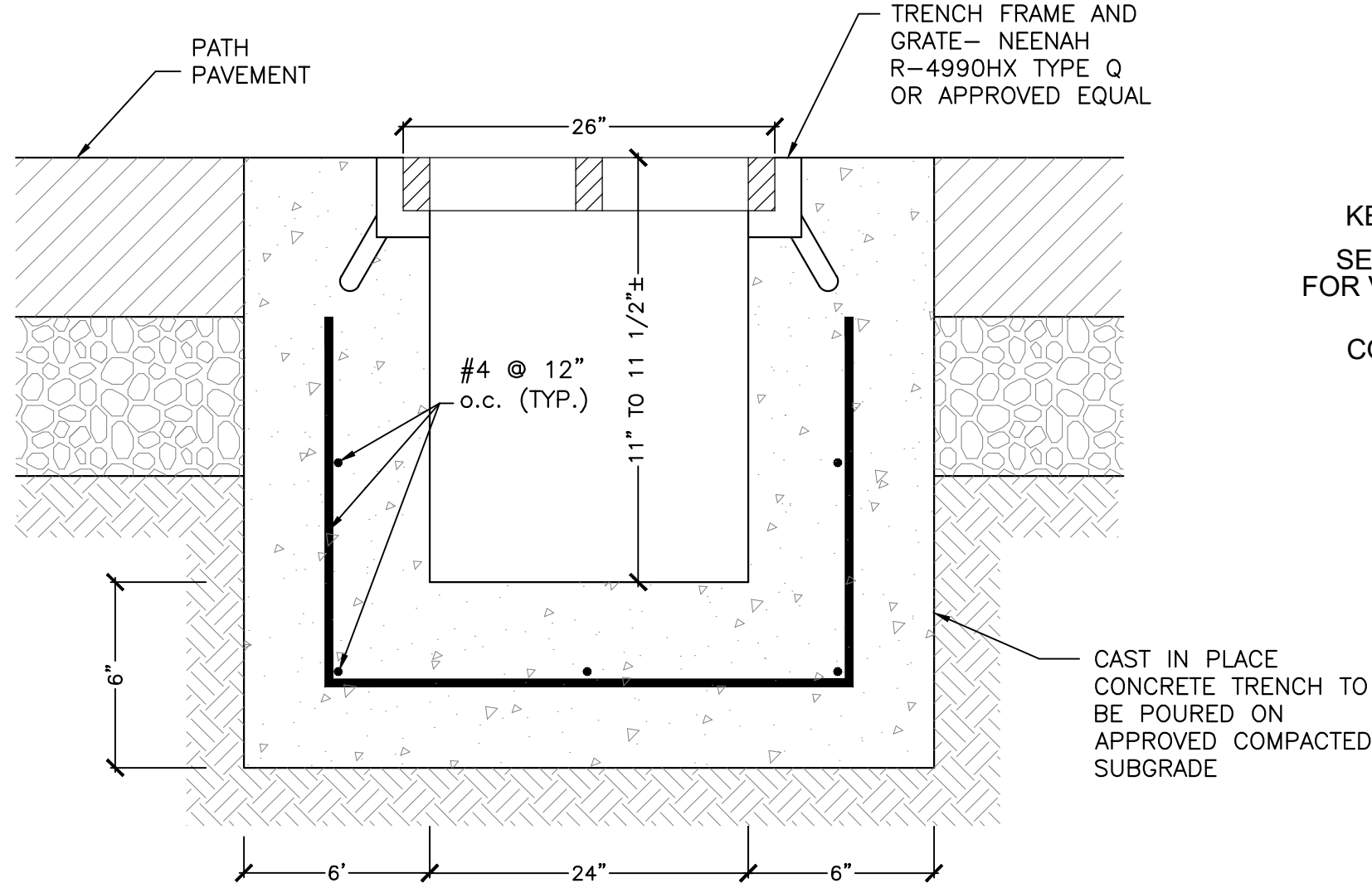
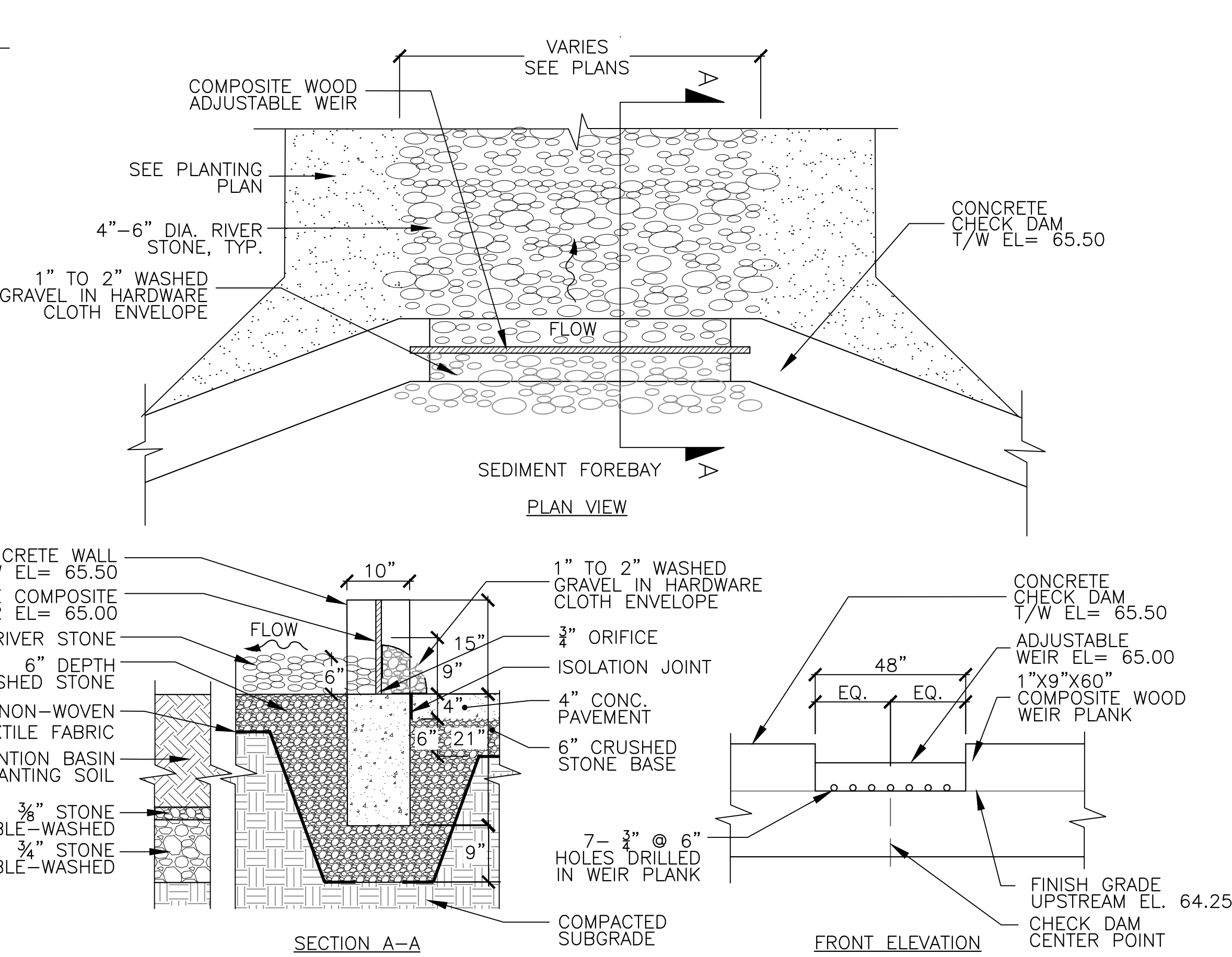


- NOTES:**
- THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE EXISTING CONDITIONS SHOWN ON THESE PLANS IS BASED ON ON A SURVEY COMBINED WITH AS-BUILT INFORMATION FROM THE PREVIOUS PROJECT PHASE. THIS INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR, PRIOR TO THE START OF CONSTRUCTION, SHALL THOROUGHLY REVIEW THE EXISTING CONDITIONS AS THEY RELATE TO THESE SITE PLAN DRAWINGS AND NOTIFY LANDSCAPE ARCHITECT OF ANY DISCREPANCIES PRIOR TO THE START OF CONSTRUCTION.
 - COORDINATE ALL GRADING AND PIPED CONNECTIONS WITH GRADING & DRAINAGE PLAN L-2.
 - CONTRACTOR SHALL STAKE LIMITS OF BIORETENTION BASIN AND SWALE IN FIELD FOR APPROVAL BY LANDSCAPE ARCHITECT PRIOR TO START OF CONSTRUCTION.
 - SEE SHEET L-10 FOR PLANT SCHEDULE.
 - CONTRACTOR SHALL SUPPLY ALL PLANT MATERIAL IN QUANTITIES SUFFICIENT TO COMPLETE THE PLANTING PLAN AS SHOWN ON DRAWINGS.
 - NO PLANT MATERIAL SHALL BE PLANTED BEFORE ACCEPTANCE OF FINAL GRADING BY LANDSCAPE ARCHITECT.
 - WATERING OF INSTALLED PLANTS SHALL OCCUR WITHIN 24 HOURS OF THE FIRST DAY OF PLANTING OR SEEDING AND CONTINUE AS OUTLINED IN THE CONTRACT DOCUMENTS.

LEGEND

- LIMIT OF WORK
- PROPERTY LINE
- 25' RIVERFRONT BUFFER
- 50' RIVERFRONT BUFFER
- 100' RIVERFRONT BUFFER
- - - EXISTING CONTOURS
- - - PROPOSED CONTOUR
- 95.10
+ (8.25)
X 64.25
1.5%
EXISTING SPOT ELEVATION
- EXISTING INTERPOLATED SPOT GRADE. CONTRACTOR TO VERIFY IN FIELD
- PROPOSED SPOT GRADE
- PROPOSED SLOPE

BIORETENTION DATA		
DESCRIPTION	ELEVATION	AREA (SF)
TOP OF BERM	65.25	1100
WATER SURFACE	64.75	910
BIORETENTION SURFACE	64.25	700
BOTTOM OF STONE LAYER	61.75	700





Town of Arlington, Massachusetts

Request for Determination of Applicability

Summary:

Request for Determination of Applicability: 26 Lakeview Street

Arlington File #A20.5

8:45pm This project proposes an addition located within the 100-ft Wetlands Buffer and Adjacent Upland Resource Area of Spy Pond.

ATTACHMENTS:

Type	File Name	Description
Request for Determination of Applicability	26_Lakeview_WPA_Form_1_final.pdf	26 Lakeview RDA Form
Request for Determination of Applicability	26_Lakeview_RDA_Narrative.pdf	26 Lakeview RDA Narrative
Request for Determination of Applicability	26_Lakeview_RDA_Plans_final.pdf	26 Lakeview RDA Plans
Request for Determination of Applicability	26_Lakeview_RDA_Site_Photos.pdf	26 Lakeview RDA Site Photos
Request for Determination of Applicability	26_Lakeview_RDA_maps.pdf	26 Lakeview RDA Maps



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 1- Request for Determination of Applicability

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

City/Town

A. General Information

Important:
When filling out
forms on the
computer, use
only the tab key
to move your
cursor - do not
use the return
key.



1. Applicant:			
Robert Bowes	bbowes@bowes.com		
Name	E-Mail Address		
26 Lakeview			
Mailing Address			
Arlington	MA	02476	
City/Town	State	Zip Code	
781-696-5945			
Phone Number	Fax Number (if applicable)		
2. Representative (if any):			
Martha Penzenik Architects			
Firm	martha@penzenik.com		
Martha Penzenik	E-Mail Address		
Contact Name			
635 Mass. Ave. Ste. 14			
Mailing Address			
Arlington	MA	02476	
City/Town	State	Zip Code	
781-643-1313	781-643-4360		
Phone Number	Fax Number (if applicable)		

B. Determinations

1. I request the Conservation Commis make the following determination(s). Check any that apply:
Conservation Commission
- ☐ a. whether the **area** depicted on plan(s) and/or map(s) referenced below is an area subject to jurisdiction of the Wetlands Protection Act.
- ☐ b. whether the **boundaries** of resource area(s) depicted on plan(s) and/or map(s) referenced below are accurately delineated.
- ☒ c. whether the **work** depicted on plan(s) referenced below is subject to the Wetlands Protection Act.
- ☒ d. whether the area and/or work depicted on plan(s) referenced below is subject to the jurisdiction of any **municipal wetlands ordinance** or **bylaw** of:
- Arlington
Name of Municipality
- ☐ e. whether the following **scope of alternatives** is adequate for work in the Riverfront Area as depicted on referenced plan(s).



WPA Form 1- Request for Determination of Applicability

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

C. Project Description

1. a. Project Location (use maps and plans to identify the location of the area subject to this request):

26

Arlington

Street Address

121

City/Town

121-1-8

Assessors Map/Plat Number

Parcel/Lot Number

- b. Area Description (use additional paper, if necessary):

Resource area is Spy Pond. The property is an Adjacent Upland Resource Area.

- c. Plan and/or Map Reference(s):

Title

Date

Title

Date

Title

Date

2. a. Work Description (use additional paper and/or provide plan(s) of work, if necessary):

Please see attached.



WPA Form 1- Request for Determination of Applicability

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

C. Project Description (cont.)

b. Identify provisions of the Wetlands Protection Act or regulations which may exempt the applicant from having to file a Notice of Intent for all or part of the described work (use additional paper, if necessary).

Please see attached.

3. a. If this application is a Request for Determination of Scope of Alternatives for work in the Riverfront Area, indicate the one classification below that best describes the project.

- ☐ Single family house on a lot recorded on or before 8/1/96
- ☐ Single family house on a lot recorded after 8/1/96
- ☐ Expansion of an existing structure on a lot recorded after 8/1/96
- ☐ Project, other than a single-family house or public project, where the applicant owned the lot before 8/7/96
- ☐ New agriculture or aquaculture project
- ☐ Public project where funds were appropriated prior to 8/7/96
- ☐ Project on a lot shown on an approved, definitive subdivision plan where there is a recorded deed restriction limiting total alteration of the Riverfront Area for the entire subdivision
- ☐ Residential subdivision; institutional, industrial, or commercial project
- ☐ Municipal project
- ☐ District, county, state, or federal government project
- ☐ Project required to evaluate off-site alternatives in more than one municipality in an Environmental Impact Report under MEPA or in an alternatives analysis pursuant to an application for a 404 permit from the U.S. Army Corps of Engineers or 401 Water Quality Certification from the Department of Environmental Protection.

b. Provide evidence (e.g., record of date subdivision lot was recorded) supporting the classification above (use additional paper and/or attach appropriate documents, if necessary.)



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

City/Town _____

WPA Form 1- Request for Determination of Applicability

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

D. Signatures and Submittal Requirements

I hereby certify under the penalties of perjury that the foregoing Request for Determination of Applicability and accompanying plans, documents, and supporting data are true and complete to the best of my knowledge.

I further certify that the property owner, if different from the applicant, and the appropriate DEP Regional Office were sent a complete copy of this Request (including all appropriate documentation) simultaneously with the submittal of this Request to the Conservation Commission.

Failure by the applicant to send copies in a timely manner may result in dismissal of the Request for Determination of Applicability.

Name and address of the property owner:

Robert Bowes

Name

26 24 Lakeview

Mailing Address

Arlington

City/Town

MA

State

02476

Zip Code

Signatures:

I also understand that notification of this Request will be placed in a local newspaper at my expense in accordance with Section 10.05(3)(b)(1) of the Wetlands Protection Act regulations.

Signature of Applicant

Date

9/16/2020

Signature of Representative (if any)

Date

Architects

635 Massachusetts Avenue Suite 14

Arlington MA 02476

781-643-1313 martha@penzenik.com

Emily Sullivan, Conservation Commission Agent
Town Hall Annex, 730 Mass. Ave. Arlington, MA 02476

September 17th, 2020

Dear Emily,

We are requesting a Determination of Applicability for a construction project at 26 Lakeview. A one story 7'-2" x 18'-0" wooden addition and a wooden stair are proposed at the rear of the property. An existing wood stair and a small vestibule structure are to be removed. The location of the addition is currently hardscape and roofing surfaces. In addition there will be a new 4'-6" x 6'-0" porch and site work which is outside of the buffer zone but part of the project. This work is included in the attached drawings.

This property is an Upland Resource Area for the Resource Area of Spy Pond. The nearest corner of the house to the pond is 69.9'. The nearest corner of the proposed addition to the pond will be approximately 84'.

As per Article 8 Wetlands Protection of the Town of Arlington By-Laws:

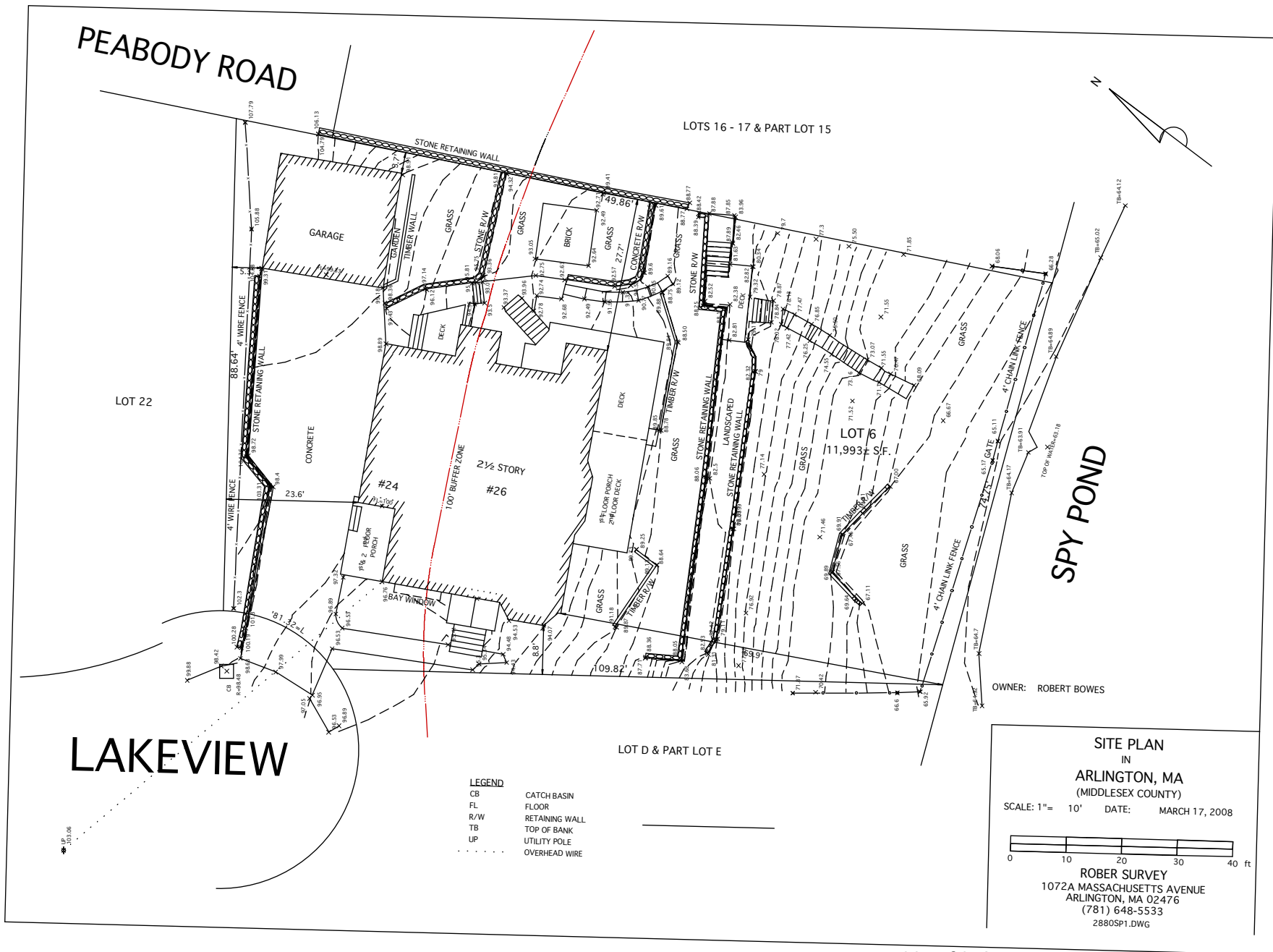
Section 2. Jurisdiction:

Except as permitted by the Conservation Commission or as provided by this Bylaw, no person shall remove fill, dredge, discharge into, build upon, degrade, or otherwise alter any marsh, freshwater wetland, vernal pool, wet meadow, bog, swamp, river, stream, creek, pond, reservoir, or lake, or any bank to said waters, or any land under said waters, or any land bordering thereon or riverfront area as hereinafter defined, or any land subject to flooding or inundation (collectively, "the resource areas protected by this Bylaw or "resource areas."

There will be no degradation or alteration to Spy Pond. The 129 square foot addition to the house will be built where there is currently, approximately, 187 square feet of concrete and roofing material. As such, there will be no increase in impermeable surface. The current wooden stair is permeable but is located on concrete. The new permeable stair will be located above grass. There are currently small decorative plants that will be relocated elsewhere on the property. All stormwater from the roof addition will be directed via gutters and downspouts to an existing drywell. There will be some repair to the existing paved walk and it's associated concrete stairs. All work will be performed by hand with no heavy equipment on the site.

As per Section 31- Climate Change Resilience of the Arlington Regulations for Wetland Protection:
B. The Applicant shall, to the extent practicable and applicable as determined solely by the Commission, integrate considerations of adaptation planning into their project to promote climate change resilience so as to protect and promote resource values into the future.

Adjacent to the border of the buffer zone and the addition, 40 square feet of permeable surface will be removed and replaced with native grasses and annual flowers to improve resiliency. There will be a decrease in surface runoff from hardscape surface as it will be removed.



Martha Penzenik Architects
635 Mass. Ave. Ste. 14
Arlington, MA

Robert And Elaine Bowes
26 Lakeview
Arlington, MA

Kitchen Add Ition
26 Lakeview
Arlington, MA

Title:

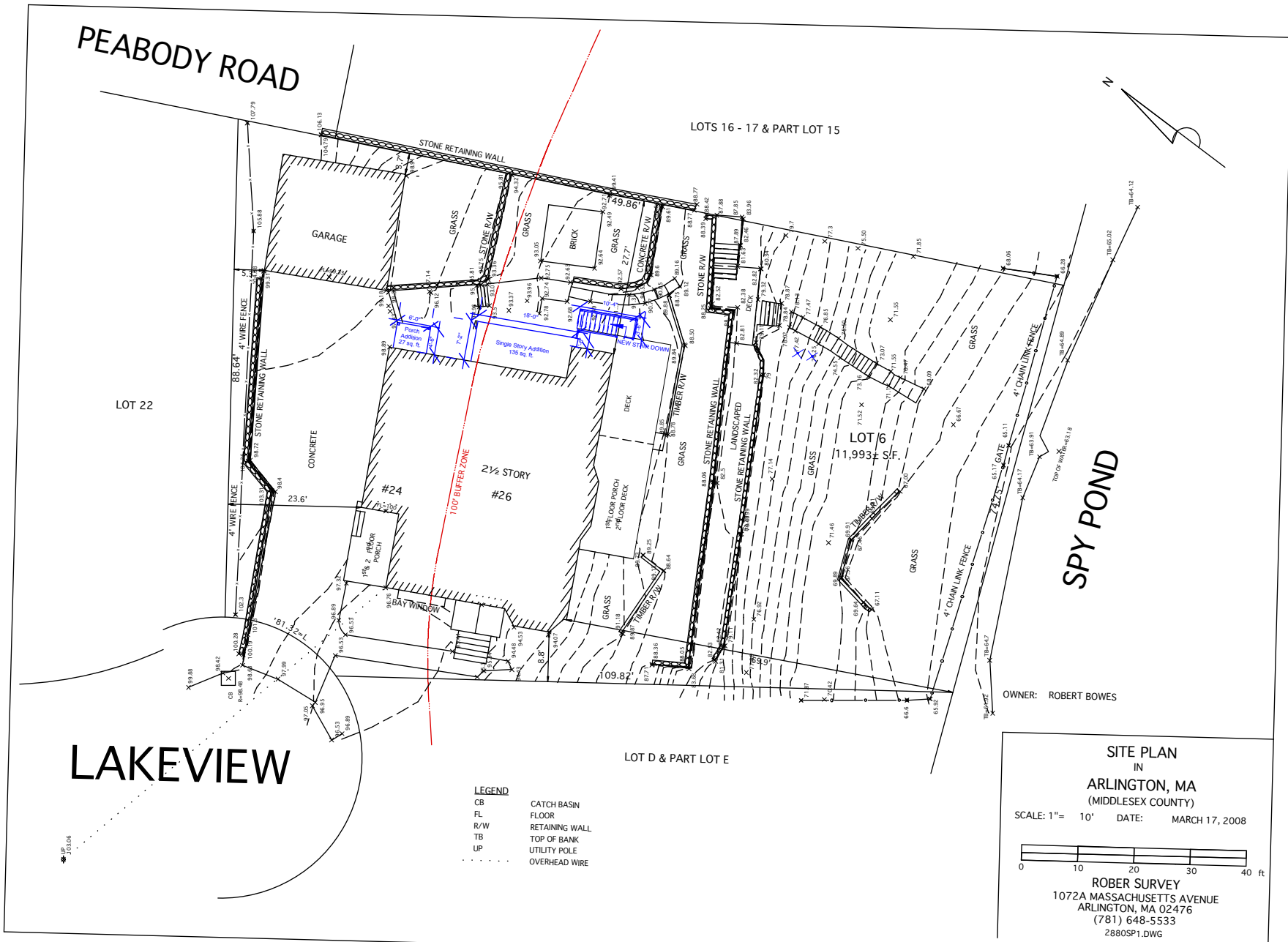
Existing
Site Plan

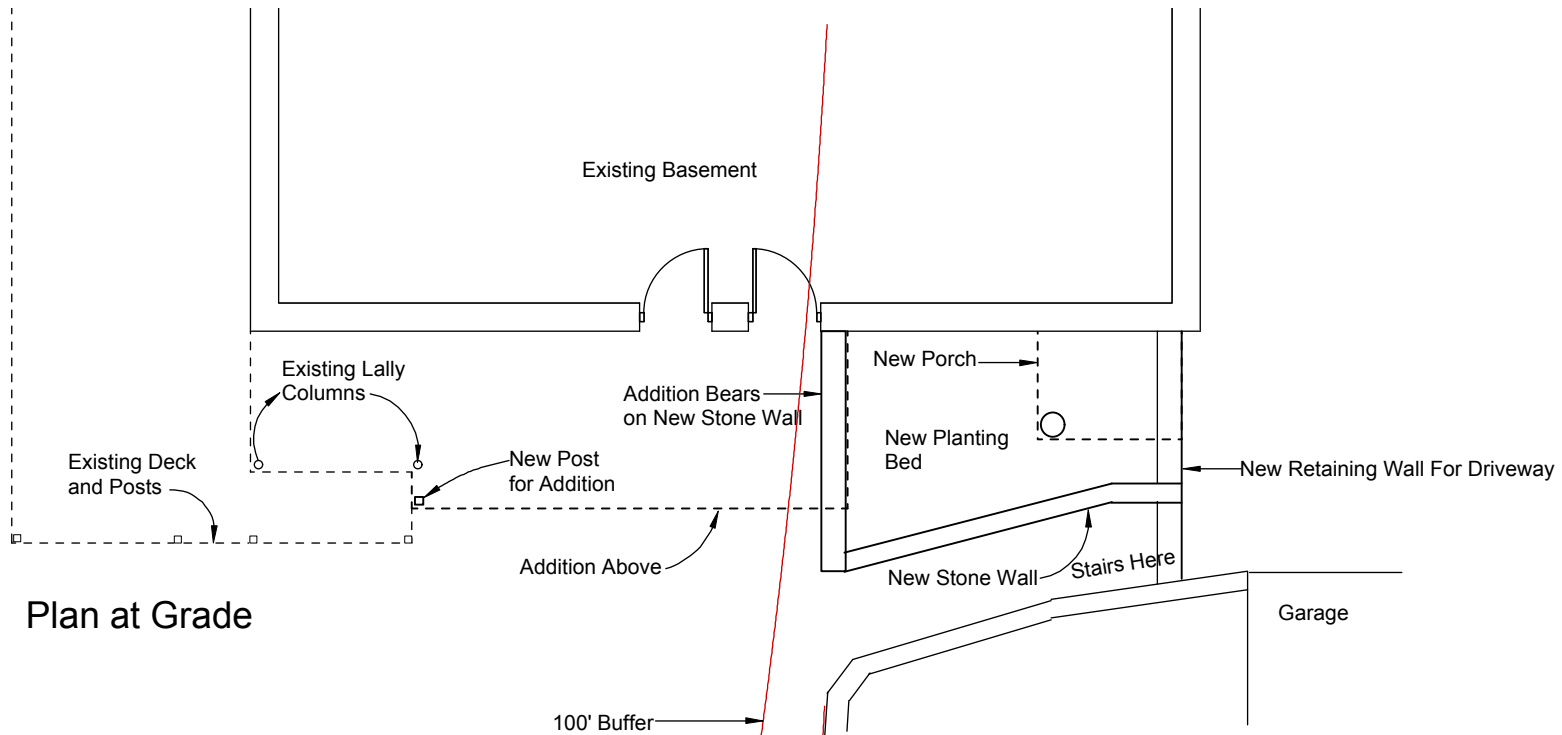
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Date
9/17/20

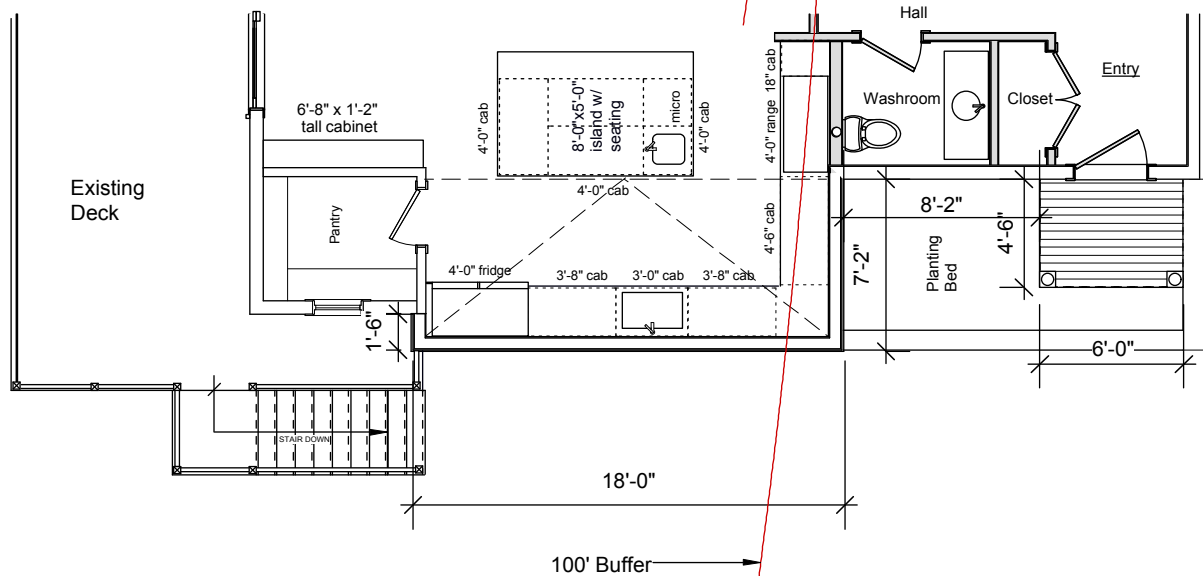
Drawing

1

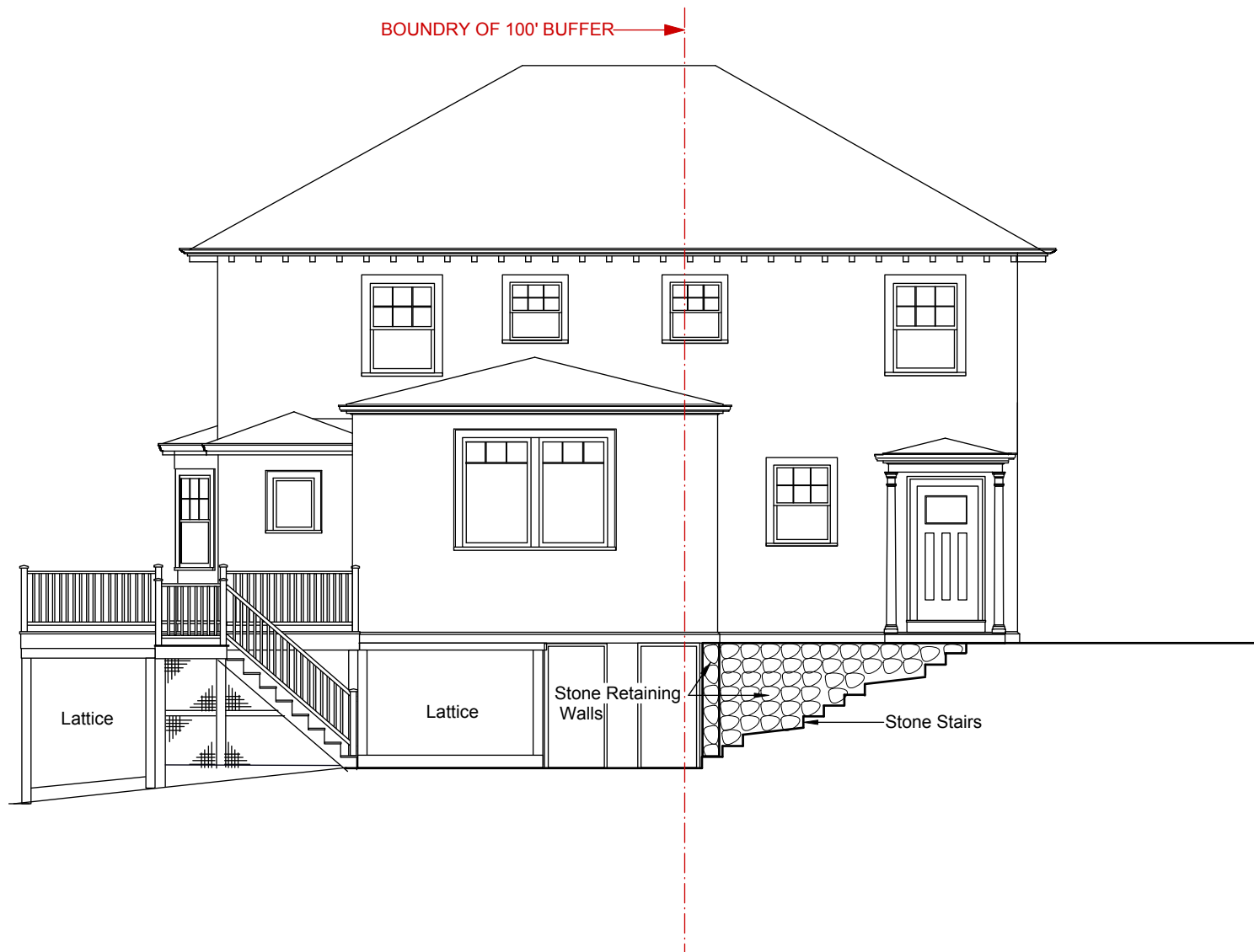




Plan at Grade



Plan at First Floor



Martha Penzenik Architects
635 Mass. Ave. Ste. 14
Arlington, MA

Robert And Elaine Bowes
26 Lakeview
Arlington, MA

Kitchen Addition
26 Lakeview
Arlington, MA

Title:

Proposed
Rear
Elevation

Scale
1/8" = 1'-0"

Date
9/17/20

Drawing

4



PHOTO 1 VIEW TO POND FROM NEAR THE ADDITION



PHOTO 2 STAIR and PARTIAL DECK TO BE REMOVED

26 LAKEVIEW ADDITION PROJECT



PHOTO 3 LOCATION OF ADDITION,
STAIR AND DECK TO BE REMOVED



PHOTO 4 EXISTING RETAINING WALL TO BE REMOVED
REPLACE WITH 6' STONE FACED RETAINING WALL
GRADE RAISED FOR PLANTING BED

26 LAKEVIEW ADDITION PROJECT

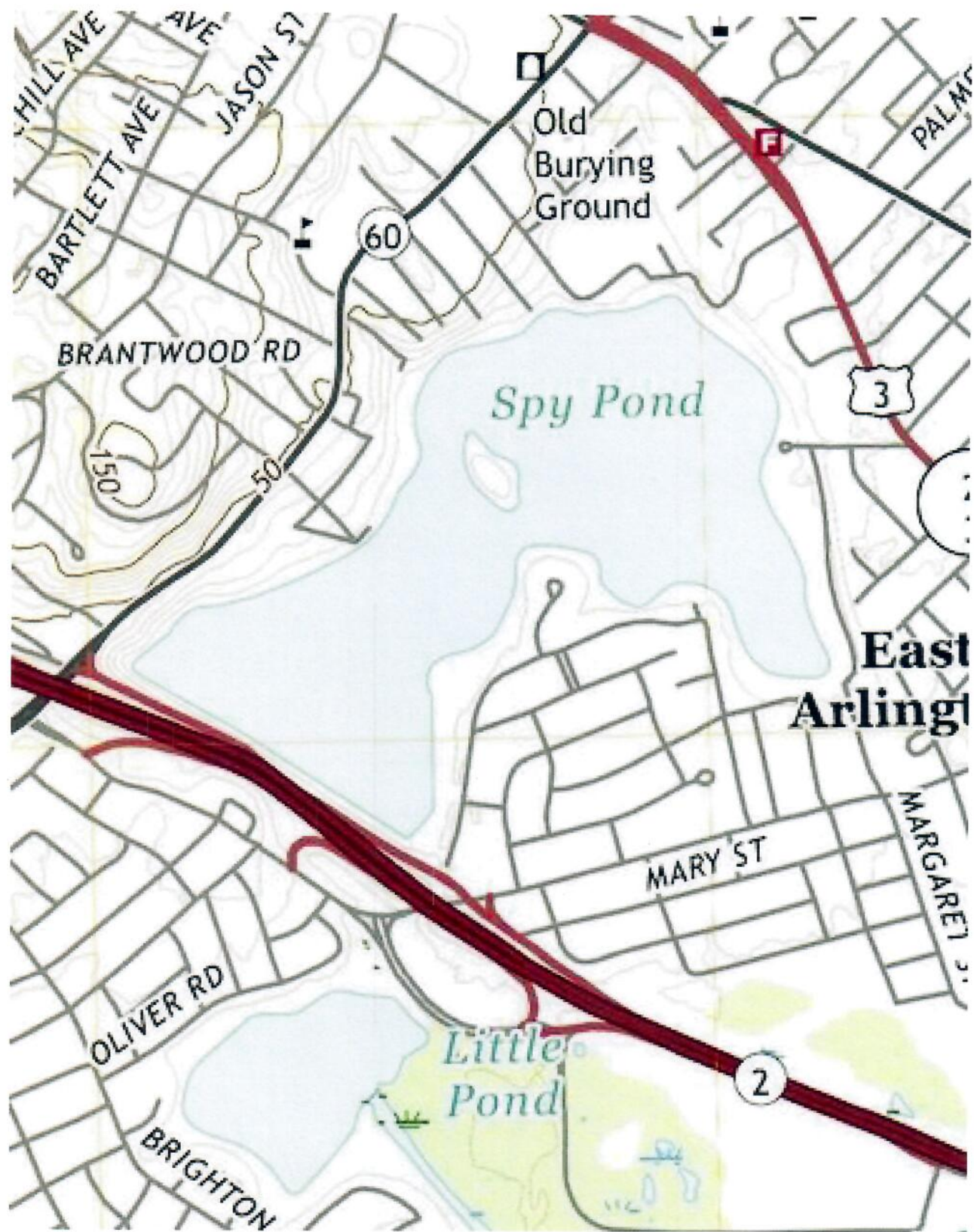
National Flood Hazard Layer FIRMette



71°09'42"W 42°24'53"N



24 Lakeview Arlington MA Flood Plain Map



24 Lakeview Arlington MA USGS Topographical Map



24 Lakeview Arlington MA Town of Arlington Topographical Map



Town of Arlington, Massachusetts

Working Session

Summary:

Thorndike Place Proposal

The Conservation Commission will meet with the Applicant's Engineer (BSC Group) and the Town's 9:00pm Third-Party Reviewer (BETA) to review application materials related to wetland resources and stormwater in advance of the Zoning Board of Appeals's 10/13/2020 hearing.

ATTACHMENTS:

Type	File Name	Description
▣ Reference Material	Thorndike_March_2020_Site_Plan.pdf	Thorndike Place March 2020 Site Plan
▣ Reference Material	Thorndike_Sept_2020_Site_Plan.pdf	Thorndike Place September 2020 Site Plan
▣ Reference Material	ZBA_Transmittal_2020-09-28.pdf	Thorndike Place Letter 09282020
▣ Reference Material	ACC_Letter_to_ZBA_Thorndike_Place_07092020.pdf	ACC letter to ZBA 07092020
▣ Reference Material	2020-08-05_Thorndike_Place_BETA_Civil-Site_Review_.pdf	BETA letter to ZBA 08052020



WETLAND EXHIBIT LEGEND

- WETLAND
- 25' WETLAND BUFFER
- 100' WETLAND BUFFER
- FLOODPLAIN / FLOODWAY

PROFESSIONAL ENGINEER

DATE

THORNDIKE PLACE

DOROTHY ROAD
IN
ARLINGTON
MASSACHUSETTS
(MIDDLESEX COUNTY)
OVERALL
SITE PLAN

MARCH 13, 2020

REVISIONS:		
NO.	DATE	DESC.

PREPARED FOR:

ARLINGTON LAND REALTY, LLC
84 SHERMAN STREET, 2ND FLOOR
CAMBRIDGE, MA 02140

BSC GROUP

803 Summer Street
Boston, Massachusetts
02127
617 896 4300

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SCALE: 1" = 100'

0 50 100

ISSUED FOR PERMITTING
NOT FOR CONSTRUCTION

FILE: 2340700\C\2340700-SP

DWG:

JOB: NO: 23407.00

SHEET C-100



PROFESSIONAL ENGINEER DATE

THORNDIKE PLACE

DOROTHY ROAD

IN

ARLINGTON

MASSACHUSETTS

(MIDDLESEX COUNTY)

OVERALL

SITE PLAN

MARCH 13, 2020

REVISIONS:

NO.	DATE	DESC.
1	9/18/20	NEW BUILDING FOOTPRINT

PREPARED FOR:

ARLINGTON LAND REALTY, LLC
84 SHERMAN STREET, 2ND FLOOR
CAMBRIDGE, MA 02140



803 Summer Street
Boston, Massachusetts
02127

617 896 4300

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SCALE: 1" = 50'



FILE: 2340700\C\2340700-SP

DWG.:
JOB. NO: 23407.00 SHEET C-101

Sent Via Email

September 28, 2020

Christian Klein, Chair
Arlington Zoning Board of Appeals
51 Grove Street
Arlington, MA 02476

RE: Thorndike Place
Revised Development Program

Chairman Klein:

Representatives from the Board of Appeals, the Department of Planning and Community Development, the Legal Department, and the Applicant for Thorndike Place met via conference call on Friday, September 11, 2020. Based on wetland resource area comments received from the Town's peer-review engineers, BETA Group, and the Conservation Commission, the Applicant is proposing to revise the site plan to avoid or minimize wetland resource area impacts under both the Wetlands Protection Act and the Arlington Wetlands Protection Bylaw and implementing regulations. On the call, it was agreed to have the Applicant's engineer provide a revised site plan with information comparing the changes in potential wetland resource area impacts from the site plan submitted in March 2020 to the revised site plan dated September 28, 2020. It was also agreed that the revised site plan would be discussed during a working session before the Conservation Commission's October 1 meeting.

Attached, please find two colored site plans. The first is the site plan submitted in March 2000 and presented at the August 25 ZBA hearing. The second site plan presents the applicant's proposed changes to the development program. In the revised plan, the proposed townhomes have been eliminated, the footprint of the multi-family building has been modified and the overall development footprint has been reduced. The revised site plan greatly reduces floodplain impacts, removes the buildings entirely from the 25-foot No Disturb Zone and 100-foot Buffer/AURA, and minimal site improvements are proposed within the 100-foot Buffer/AURA.

Below is a comparison of the of the potential wetland resource area impacts between the original and revised site plans. The applicant has developed a revised site plan striving to avoid or minimize impacts. As shown in the tables below, potential impacts have been significantly reduced with the revised plan.

Engineers

Environmental
Scientists

Custom Software
Developers

Landscape
Architects

Planners

Surveyors



Original Site Plan – March 2020

Resource Area	Building (SF)	Pavement (SF)	Other (SF)	Total (SF)
Floodplain (WPA and local)	14,468	45,892	36,464	96,824
Isolated Wetland (local)	0	193	50	243
Bordering Vegetated Wetland (BVW) (WPA and local)	0	0	0	0
25' No Disturb Zone – Isolated (local)	593	4,454	1,561	6,608
25' No Disturb Zone – BVW (WPA and local)	0	0	0	0
100' Buffer/AURA - Isolated (local)	10,488	19,218	9,102	38,808
100' Buffer/AURA - BVW (WPA and local)	11,011	0	0	11,011

Revised Site Plan – September 28, 2020

Resource Area	Building (SF)	Pavement (SF)	Other (SF)	Total (SF)
Floodplain (WPA and local)	5,457	439	11,341	17,237
Isolated Wetland (local)	0	0	0	0
Bordering Vegetated Wetland (BVW) (WPA and local)	0	0	0	0
25' No Disturb Zone – Isolated (local)	0	0	0	0
25' No Disturb Zone – BVW (WPA and local)	0	0	0	0
100' Buffer/AURA - Isolated (local)				
100' Buffer/AURA - BVW (WPA and local)	0	477	726	1,203



We look forward to discussing the revised plan with the Conservation Commission and BETA at the working session on October 1.

Please call me at 781-710-7280 or email me at jhession@bscgroup.com if you have any questions or require additional information.

Very truly yours,

BSC Group, Inc.

A handwritten signature in black ink, reading "John Hession".

John Hession, P.E.
Director of Land Development

cc: zba@town.arlington.ma.us
Richard Vallarelli, ZBA
Emily Sullivan, Conservation
Susan Chapnick, Conservation Commission
Jenny Raitt, Planning and Community Development
Marta Nover, BETA
Stephanie Kiefer, Smolak & Vaughan
Gwen Noyes and Arthur Klipfel, Arlington Land Realty



TOWN OF ARLINGTON

MASSACHUSETTS

CONSERVATION COMMISSION

July 09, 2020

Zoning Board of Appeals
Town of Arlington
730 Massachusetts Avenue
Arlington, MA 02474

**RE: Thorndike Place – Application for Comprehensive Permit
Second Set of Comments from Conservation Commission
Applicant's March 2020 submittals**

Dear Chairman Klein and Members of the Board:

The Arlington Conservation Commission (hereinafter "ACC") provides this second set of comments to the ZBA, this time addressing the information Arlington Land Realty LLC (the "Applicant") filed in March 2020 to supplement its Comprehensive Permit Application, filed with the Town on or about August 31, 2016 (the "Application"). The ACC provided initial comments to the ZBA on the Application by letter dated September 26, 2016. The Supplemental Information fails to address many of the Commission's initial comments.

SUMMARY OF COMMENTS

The Applicant needs to provide:

- a wetlands delineation that is performed during the growing season rather than the winter;
- data forms to support the wetlands delineation its consultant performed in January 2020, outside of the growing season;

- an explanation of why areas previously identified and approved by the ACC (in 2001) as isolated wetlands are not shown on the project plans and their relationship to the 100-year floodplain delineated by FEMA in 2010;
- a narrative wetlands report and back-up data sheets, describing all wetland resource areas protected under the Act and the Bylaw;
- stormwater management calculations and report to address compliance with Stormwater Management Standards;
- calculation of flood storage volume that will be lost under the proposed project configuration, alternative configurations, and calculation of compensatory flood storage at each elevation;
- a wildlife habitat evaluation;
- a more detailed and specific request for waivers and justification for waivers under each specific provision of the Town's wetlands regulation (June 4, 2015);
- what specifically it means by terms such as "green landscaping" and "rain gardens" and ability to implement such measures on the site taking into account water table and site conditions;
- more information about landscaping, justifications for tree and vegetation removal, and details of proposed mitigation in relation thereto and in consideration of the resource area values of the Town's Wetlands Bylaw and wetlands regulation; and
- an Alternatives Analysis as required by the Town's wetlands regulation for work within the Adjacent Upland Resource Area.

Once the above information is provided, the ZBA's peer review consultant should be engaged to review:

- Wetland delineations
- Flood plain delineations, flood storage volume lost, and compensatory flood storage
- Stormwater information and calculations
- Potential impact of the project on water quality, ecological diversity including vegetation and wildlife habitat, and adaptation to anticipated climate change effects of extreme weather including increased precipitation and extreme heat

1. Introduction

The ACC comments from two perspectives or capacities. First, in its regulatory role, as the usual administrators of the state's Wetlands Protection Act, G.L. c. 141, s. 30 (the "Act" or "WPA") (and implementing regulation) and the Town of Arlington Wetlands Protection Bylaw, Title V, Article 8 (the "Bylaw") and implementing regulations dated approved June 4, 2015 (a copy of which is attached to our September 26, 2016 letter). Second, pursuant to its broader duties under Massachusetts G.L. c. 40, s. 8C to promote and protect the Town's natural resources and watershed.

Pursuant to the Comprehensive Permit law, Mass. Gen. Laws ch. 40B, the **Zoning Board will be administering the Bylaw (not the Act) when reviewing the Thorndike Place application.** We thus

provide the following background information and comments to assist the Zoning Board in this role. The Applicant will have to file an application with the Conservation Commission to review the project under the Act.

2. Wetland Resource Areas including Floodplain

Under state and local wetlands laws and regulations, anyone wishing to do work in or near areas called “wetland resource areas” must first receive permission of the ACC. Wetland resource areas include swamps, bogs, meadows, forested wetlands, vernal pools, isolated land subject to flooding and also streams, rivers, ponds, lakes, banks of those water bodies, land within 100 feet of those areas, and the 100-year floodplain.¹ State and local regulations define each of these areas including their boundaries.

Arlington Town Meeting many years ago adopted the Town of Arlington Wetlands Protection Bylaw (“Bylaw”) to protect more areas than are protected under the Act and to provide greater protection of those areas. The Bylaw usually is administered by the ACC. The ACC has adopted regulations to complement and implement the Bylaw. The ACC’s June 5, 2015 Wetland Regulations, which implement and interpret the Bylaw apply to this project. The Commission revised its regulations after the Applicant submitted its 40B application, so understands that the June 5, 2015 regulations apply (as attached to our September 26, 2016 letter to the ZBA).

Wetland resource areas provide many important functions and values, such as public or private water supply, ground water supply, flood control, erosion control and sedimentation control, storm damage prevention, other water damage prevention, prevention of pollution, protection of surrounding land and other homes or buildings, wildlife protection, plant or wildlife habitat, aquatic species and their habitats, the natural character or recreational values of the wetland resources, and climate change resilience.

The purpose of the Act and Bylaw are to protect these areas so they can continue to provide these functions and values.

A. Wetland Areas On Project Site Should Be Delineated

Updated wetland resource area delineations performed during the active growing season are necessary to evaluate the project. Additionally, we recommend a peer review of the Applicant’s wetland resource area delineations.

There are four wetland resource areas identified so far on the Thorndike Place application, which include the following:

1. bordering vegetated wetlands (called “BVW”)(protected under the Act and Bylaw);
2. isolated wetlands (protected under Bylaw only);
3. areas within 100 feet of BVW and isolated wetlands, called either:
 - a. Buffer Zone (under the Act), or
 - b. Adjacent Upland Resource Area (“AURA”) (under the Bylaw); and

¹ The 100-year floodplain is often described generally as an area which is expected to flood once every one hundred years. Another way it is described as the area that has a 1% chance of flooding once a year.

4. the 100-year floodplain (also called “bordering land subject to flooding” or “BLSF”) (protected under the Act and Bylaw).

We know from the Application as well as prior proceedings concerning the Mugar property that wetland resource areas are extensive on the site. Even the developer acknowledges this fact (see pp. 16 of Application).

However, despite the wetland delineations performed in January 2020, there is no current legally valid delineation under either the Act or Bylaw of the boundaries of these resource areas. The Applicant has not yet filed the necessary application with the ACC to receive such determinations of the locations of the wetland resource area boundaries.

The Zoning Board will have to determine whether the Applicant’s delineation of wetland resource areas under the Bylaw is valid. When it receives an application under the Act, the ACC will determine whether the delineations are valid under the Act.

Because so much of the Mugar property consists of wetland resource areas, it is difficult for the ZBA or the ACC to review the project unless and until the wetland resource areas are accurately delineated and clearly depicted on plans showing existing and proposed conditions. For example, the southeast corner of the proposed apartment building is very close to the BVW shown on the project plan (see Sheet C-101 “Overall Site plan,” rev. March 13, 2020, showing proposed structures over existing conditions), but the border of that BVW has not been approved by the ACC under state and local wetland laws, so its location may not be accurate. If the boundary of the BVW is in fact farther to the west, that could require a change to the building footprint to move it outside of the BVW, which in turn could change other aspects of the proposed project.

The wetlands information provided by the Applicant to date is incomplete or even inaccurate:

1. **Problematic Winter Time Delineation:** Note 5 on Plan Sheet V-100, Existing Conditions, states that a wetlands delineation was done on January 15, 2020, which was winter time. Winter time delineations are difficult and thus lack accuracy because vegetation is not leafed out or even present, and soils often are frozen. Wetlands are defined by the type of vegetation that grows in a particular area and the soils that support such vegetation. It is much harder to identify vegetation without their leaves and examine soils if the ground is frozen. Like other conservation commissions, the ACC strongly discourages wintertime wetland delineations, by stating that resource area delineations will be reviewed only between April 1 and December 1 of each year. Wetlands Protection Bylaw Regulations, § 10.G.
2. **Missing Data Forms:** The Applicant needs to provide the data, often on forms called “Appendix G,” that the Applicant’s consultant should have prepared to support the

delineation of the BVW's. These forms will be needed when the Applicant applies to the ACC under the Act, so there is no reason not to share them now.

3. **Isolated Wetlands are Not Shown.** In 2000, a developer interested in the Mugar site filed with the ACC an Abbreviated Notice of Resource Delineation seeking approval of wetland resource delineations. The ACC in 2001 approved the BVW and isolated wetland delineations, but not the delineation of the 100-year floodplain due to then-outdated FEMA maps; the FEMA maps were revised in 2010.² The ACC's peer review consultant, the BSC Group, Inc., identified four areas of isolated wetlands, which were added to the plans as Wetlands F, G, H & I. An excerpt of the plan is attached hereto, along with the October 17, 2000 letter from Rizzo Associates (the developer's consultant) memorializing those additions. The areas of Wetlands H & I should now be examined for presence of isolated wetland as they are located where the current development is planned. If the isolated wetlands previously delineated are located within the 100-year floodplain on revised FEMA maps, this should also be noted.
4. **100-year Floodplain Line.** On all plans, especially the Existing Environmental Resources Plan (C-100), Overall Site Plan (C-101), and the Grading and Drainage Plans (C-104 and C-105), the 100-yr floodplain line needs to be clearly marked.

We strongly urge the Zoning Board to have its peer review consultant review the new resource area delineations, especially BVW and isolated wetlands, completed before December 1, consistent with the Town wetland regulations (Section 10.G).

B. Regulation of Work In and Near Resource Areas – “Performance Standards”

Once the wetland resource area boundaries are known, then the question is whether the work in those areas meets specific requirements. Work must meet the requirements of the Bylaw.

The local (as well as state) wetland regulations contain standards to determine whether work can be done in each resource area, and, if so, under what conditions. An applicant has the burden of proving that the proposed work meets the applicable standards, often called “performance standards.” If the ACC – or here, the Zoning Board - determines it does, then work could be allowed in those areas provided conditions can be imposed to ensure the resource areas are protected. As noted above, the performance standards under the Bylaw and its regulations are stricter than those under the state Act and its regulations. Each of the above-listed resource areas have unique requirements that must be met.

² While conducting resource area delineation, the Applicant should consider making determinations on the location of Isolated Lands Subject to Flooding (as qualified under the Act) in areas of possible isolated wetlands, as this would be helpful to the Commission when the Applicant files the Notice of Intent to the Arlington Conservation Commission under the Wetlands Protection Act.

Since the ZBA is responsible in the Comprehensive Permit process for administering the Town's Wetlands Protection Bylaw (but not the Act which remains the ACC's jurisdiction under state law), we provide the following table that outlines the applicable performance standards under the Bylaw and its regulations, has the citation to the Town's wetland regulations, and notes how the state wetlands standards in the Act differ, if at all.

Table 1. Comparison of Town Bylaw/Regulations and State Act for Applicable Performance Standards

Resource Area	Standards (summary) in Town Bylaw or Regulations	Citation to Town Wetland Bylaw / Regulations	How Town Standard Differs from State Standard in the Act
Bordering Vegetated Wetland (BVW)	No work allowed in wetlands though can allow up to 5,000 sq. ft. be lost if replicated at 2:1 ratio (replicated to lost)	Section 21 of Town wetland regulations	State requires only 1:1 replication whereas Town requires 2:1
Wetland (isolated)	Same as above	Section 21 of Town wetland regulations	State does not protect these
100-foot Adjacent Upland Resource Area ("AURA")	No work within 25 feet; work within 25-100 feet shall be avoided and alternatives pursued – allowed only if no reasonable alternatives; 4 "Disturbance Areas" defined	Section 25 of Town wetland regulations Section 24 Vegetation Removal and Replacement	State standards much less protective; State calls this area the "Buffer Zone"
Bordering Land Subject To Flooding (BLSF 100-year Floodplain)	Prohibits work that will: 1. Cause flood damage due to lateral displacement of water; 2. Adversely effect on public and private water supply or groundwater supply, or 3. Cause an adverse effect on the capacity of said area to prevent pollution of the groundwater. Compensatory flood storage allowed at 2:1 (created vol:lost vol)	Section 23 of Town wetland regulations	- Boundary definition differs - State's compensatory flood storage requirement of only 1:1 where Town requires 2:1 (created vol: lost volume)

Even with the unverified wetland boundaries proposed by the Applicant, it looks like some portions of buildings, roadways, parking areas, and other infrastructure may be within wetland resource areas, especially floodplain and isolated wetlands. The proposed trails in the 11+ acre area proposed for

conservation are near or possibly in wetlands; therefore, the placement of these trails also need to be evaluated once the wetland boundaries are updated. Portions of buildings are within BLSF and the Applicant has not shown it meets compensatory flood storage standards.

Furthermore, the project proposes alterations within the AURA, which is a resource area under the Bylaw and recognized as important by the Massachusetts Association of Conservation Commissions (MACC) Buffer Zone Guidebook, 2019: "Massachusetts is experiencing increased incidence of heavy precipitation events and increased drought because of climate change. This increases the need for flood storage capacity and water providing ecosystem services provided by wetlands, supported by adjacent buffer and riparian corridors." While the MACC Buffer Zone Guidebook was published in 2019, it summarized fundamental scientific studies and principles known and accepted well before then.

C. Vegetation Removal and Replacement Requirement

Trees and vegetation to be removed must be counted and replaced in accordance with the Bylaw and Town regulations and additional details on landscaping plans need to be provided.

The Application does not include sufficient information to evaluate adequate replacement of the trees and other vegetation planned to be removed.

Vegetation in a resource area provides wildlife habitat, flood and storm damage control, and improves water quality. Plant size, abundance, and variety are generally proportional to habitat value; thus, large wooded areas with a variety of native trees and understory plants, such as this property, are of greatest habitat value. "Vegetation slows runoff velocity so that it has greater potential to infiltrate into soil and has less erosion potential. Most studies find that buffers dominated by trees or a mix of vegetation cover types (e.g., trees, shrubs, and grasses) are most effective in removing nutrients and sediment pollution...in addition to removing pollutants, vegetation improves water quality by stabilizing banks and moderating water temperature through shading" (Massachusetts Association of Conservation Commissions Buffer Zone Guidebook, 2019). In these ways, vegetation is critically important to climate change resilience, as well, which is an important criterion for ZBA review of proposed projects (Section 6.3 of ZBA Comprehensive Permit Regulations).

The characterizations of this property in the Application are highly subjective and purpose-driven, trying to minimize the important role of existing vegetation. The Applicant points out that there are invasive plant species on the property. That is true; however along with the invasive plants of phragmites, Norway Maples and multiflora rose, there are hundreds of other beneficial native and non-native species such as willow, cottonwood, red maples, and greenbrier.

To use this condition of the land as an excuse to build permanent buildings, structures and required mitigations that will definitely impact the natural resources, while describing them as improvements, is not accurate or appropriate and should not be accepted. The western part of the site proposed for buildings including the "West Wing" could accurately be described as "Forested Adjacent upland with

shallow ground water.” This description is supported by the dominant tree in the woods in this area, cottonwood, which is a floodplain species.

Applicable to work in all local wetland resource areas is the requirement that any vegetation removed or extensively pruned cannot be done without permission of the ACC and “in-kind replacement.” Section 24.C. of the Town’s wetland regulations details this requirement. “In-kind replacement:”

Refer[s] to a combination of species type and surface area as defined by the area delineated by the drip line of the affected plant(s). “In-kind” means the same type and quantity of plant species that was removed, extensively pruned, or damaged, unless compelling evidence is presented in writing that explains why the resource area values under the Bylaw are promoted through an alternative proposal (such as biomass equivalent), and planted within the same resource area or another resource area located in close proximity on the project site. Notwithstanding the foregoing, only non-invasive plant species shall be planted as replacements.

The Applicant must provide specific information, including but not limited to the reason for removal and a detailed planting plan showing the location, size, and species of vegetation to be removed as well as the proposed replacements.

Former plan sheet C-1.0B “Existing conditions” plan, updated 8/12/15, shows tree counts for removal, with “T” numbers (updated plan sheets do not include a count of trees planned for removal). There are hundreds of trees planned to be removed. It is not clear where the required mitigation for these trees is going to be planted, in accordance with Section 24.E.5 of the Town’s wetland regulations. They cannot be placed in the adjacent resource areas as these are currently occupied by trees.

While landscaping plans are provided in the updated materials (C-102 and C-103), they do not describe the species, numbers, exact locations and care instructions of all plants in the design. Currently, the landscaping plans include symbols for either a “deciduous” or “evergreen” tree with no other details. Furthermore, the narrative in the original application under “Landscaping,” which was not updated, states that the purpose of the landscaping throughout the property is to be strategically located to “screen views” including to “block headlights.” In other words, there is no consideration in the landscape design for lost wildlife habitat or ecological diversity.

The Applicant needs to describe how the proposed plantings will compensate for the numbers, density, species and variety of vegetation (trees, shrubs, grasses, etc.) that will be removed for the Project and how the resource area values lost due to vegetation removal (including wildlife habitat, storm water / flood control from mature trees, pollution prevention, etc.) will be mitigated.

D. Stormwater

The applicant must provide additional information so that stormwater management can be evaluated. Additionally, we recommend a peer review of stormwater information and calculations once details are provided by the Applicant.

The ACC reviews, in coordination with the Engineering Department, stormwater management during its review of projects under the Bylaw (and Act). The state (MassDEP) has Stormwater Management Standards that apply under the Bylaw (and Act). See Section 32 of the Town's Wetland Regulations. The Town Engineer implements the Town's Stormwater Bylaw, so we defer to him for compliance on that.

The ACC cannot determine whether the Thorndike Project meets the Stormwater Management Standards, because the Applicant has not submitted the necessary detailed stormwater management analysis that includes results of computer modeling using HydroCAD software. Such modeling is required for the 2-year, 10-year, and 100-year storm events. Also, no groundwater information has been provided. Runoff and calculations should use the "Cornell" precipitation estimates (based on 2008 data) or, even better, the NOAA's Atlas 14 estimates (based on 2015 data), which the Commission has the discretion to require. For the stormwater evaluation, TP-40 precipitation values should not be used as MassDEP has acknowledged that its Stormwater management regulations pertaining to precipitation intensity and frequency need to be updated because the TP40 precipitation values developed in 1961 do not reflect current or future precipitation patterns. We understand that MassDEP soon will be requiring the use of NOAA-14 precipitation estimates.

The Application does not include this required stormwater information.

Based on the limited information provided, we have the following comments:

1. The project design does not appear to reflect consideration for environmentally sensitive areas such as wetlands.
2. The Applicant should undertake a more comprehensive environmental evaluation before the project is considered.
3. Sufficient hydrologic testing should be conducted to ensure that this project will not adversely impact water levels in the adjacent wetland area, sanitary sewage system, and neighborhood already stressed from flooding events.
4. For proposed areas of pervious pavement - the Applicant should provide details of pervious pavement design, including elevations of sub-base and relationship to groundwater elevations, to demonstrate whether or not these areas will retain rainfall, or merely exacerbate flooding on adjacent properties.
5. For the proposed Bioretention Cell, water quality/detention area, floodplain compensation, and drainage culvert - the Applicant should provide details of these features on the plan, including elevations and the relationship of these features to the groundwater elevations throughout the year.

6. Northeast corner berm - This proposed mitigation is within the floodplain, so will not function properly as it already will be full of water during a flood event.

E. Floodplain and Floodplain Storage

The applicant must provide additional information so that impacts on flooding and the floodplain can be evaluated. Additionally, we recommend a peer review when details are provided.

The Application states that the site is 17.7 acres and approximately 11.5 acres of the site consists of floodplain, and that 100-year floodplain and elevations defined by FEMA will be utilized in design. Clear documentation should be provided showing the relationship and elevations of proposed buildings, paved areas, and compensatory flood storage areas to the 100-year floodplain. The drawings submitted do not show site development features overlaid on the 100-year floodplain boundary defined by FEMA.

While the application notes that buildings are generally located in areas above the 100-year floodplain, this is not clearly evident from the information submitted to date, since it appears that portions of both the east and west wings, one or more of the townhouses overlap with the 100-year floodplain. The ACC is concerned that the structured parking area of the apartment building is proposed for the ground floor or basement level of the new building. This parking garage should be constructed in such a manner that it is above the 100-year flood elevation. For areas of the building located in the flood zone, flood water should be allowed to enter and exit without impediment, through open grates or vents in the building walls.

In addition to site plans, the Applicant should provide calculations of flood storage volume that would be lost as a result of the proposed project. For projects in or near floodplain, any starting point for meaningful discussion requires an engineer's analysis of estimated fill and excavation and cross sections of graded area. Therefore, the ACC requests that the Applicant provide the requested documentation of incremental volume of fill at each elevation in the floodplain that is associated with the Development layout, as well as alternative configurations that avoid encroachment on the floodplain.

Any volume of floodplain taken up by structures, columns, stairs, elevators, walls, footings or such should be compensated for by provided by compensatory flood storage from some area outside of the current floodplain. The Applicant should provide calculations showing the foot-per-foot basis for the proposed compensatory flood storage; that is, for each cubic foot filled at each foot of elevation, there will be replacement storage volume created for each volume lost at the same elevation at the ratio required by the Bylaw (2:1).

While the Application also states that there are areas on the site that can be used for mitigation for building on the floodplain, it appears that areas marked on the Sheet "Grading and Drainage Plan - East" (Plan Sheet C-103) as compensatory flood storage are located in the floodplain, so will not function properly as it already will be full of water during a flood event and thus does not count as compensatory flood storage. Another area marked as flood compensation areas is located in or near a wetland, on "Sheet Grading and Drainage Plan - West" (Plan Sheet C-104). This will further impact natural resources and not function as storage during a flood event. Pursuant to both Arlington's regulations, as well as the State WPA, compensatory flood storage shall mean a volume not previously used for flood storage.

3. Requested Waivers

The Applicant should provide further details on waivers requested. The ACC recommends that no waivers of local wetland requirements should be granted.

We urge the ZBA not to grant any waivers of the Bylaw or town wetland regulations because of the important functions provided by the wetland resource areas on the Mugar property. There is a history of major flood events in this part of Arlington that causes extensive property damage. Floodwaters contain sewage from Sanitary Sewer Overflow (“SSO”) discharges and contaminated floodwaters. Flooding in this part of town is a major concern of local residents. Prevention of additional flooding is a valid “Local Concern” (as defined in 760 CMR 56.02) that warrants denying waivers of the Bylaw and local wetland regulations.

Specifically, we oppose the requested waivers of Section 23 C & D, Section 24, and Section 25 B-D of the local wetland regulations. Section 23 “Land Subject to Flooding (Bordering and Isolated)” is critical to flood control and storm damage prevention as discussed above. Section 23.C requires written permission of the Conservation Commission for any activity (other than maintenance) which results in building within or upon, removing, filling, dredging, or altering land subject to flooding. Section 23.D requires 2:1 compensatory flood storage ratio for each volume of flood storage lost at each elevation. These requirements should not be waived.

Section 24 “Vegetation Removal and Replacement” has been discussed above as critical to many resource values, including but not limited to: flood control, wildlife habitat, pollution control, and climate change resilience. The specific requirements for vegetation replacement and mitigation should not be waived.

Section 25 “Adjacent Upland Resource Area” subsections B through D define the AURA as a resource area (as opposed to a “buffer zone” in the Act). This gives the Town stronger protections for these vulnerable upland areas that can provide a multitude of resource benefits including wildlife habitat functions, pollution control, heat control, flood control, protection from erosion, storm damage prevention, among others. There is scientific consensus that significant physical, chemical, or biological alterations to the AURA will have significant physical, chemical, or biological impacts on the associated /adjacent wetland resource areas (see MACC Buffer Zone Guidebook, 2019). The ability of the AURA to provide these functions increases with increasing buffer width and continuity. The requirements set forth in Section 25 B through D should not be waived.

In addition, we find the Applicant’s requested waiver of the consultant fee provision to be confusing. Because the consultant fee assessed equals the price of the selected peer reviewer’s contract, we do not understand how a portion (25%) of that cost could be waived.

4. Other Comments on the Application

The ACC provides the following additional comments on the Application.

A. Flooding

FEMA mapping is ten years old and is based on past events. Since the large-scale development and urbanization in the proximate Alewife area have resulted in an increase in impervious area and this coupled with extreme precipitation events and changing precipitation patterns could increase the frequency and severity of flooding in the area. Given the size of the proposed development and the area's vulnerability to flooding, development in the floodplain should be minimized and mitigation measures should be robust and fully analyzed. It should consider the cumulative effects of development. The possibility that flood waters may be contaminated with contaminated stormwater runoff and sewage from Combined Sewer Overflows in the Cambridge Alewife area further points to the need for thorough investigation and mitigation.

B. Open Space

Regarding statements that 11 acres of the property are to be preserved in perpetuity as open space; these wetlands, areas within 100 feet of wetlands, and the floodplain should be maintained in a natural state and not turned into a "park." The wetland creation across Route 2 in Cambridge with its boardwalks is a nice example, but it should be noted that not all wildlife tolerate the proximity of the public on these paths. Seclusion for nesting, feeding and breeding behaviors are also necessary for most wildlife.

C. Environmental Impact

The Applicant should provide a narrative explanation of how the proposed project meets the "Limited environmental impact" review criteria specified in the ZBA Comprehensive Permit Regulations (adopted 7/08/2015) Section 6.2 and specific details about how the development demonstrates that it will "improve water quality, control flooding, maintain ecological diversity, promote adaptation to climate changes" if not already addressed in the above submittals, consistent with the ZBA Comprehensive Permit Section 6.3 criteria.

D. Outside parking

The parking spaces and driveways of the proposal should be constructed using porous paving methods or have these impervious areas go directly to stormwater treatment and detention areas (along with the roof drainage) so that flooding in the area is not aggravated. A parking lot is located in the northeast corner of the property and Plan Sheet C-1.0B shows two small wetlands in this location. This is a permanent impact to these wetlands and should be avoided.

E. Sanitary Sewers

All proposed new houses and apartments should have backup prevention valves and allow for storage of sanitary sewage during flood events. The existing sanitary sewer system in the neighborhood is old with significant leakage during rain events when stormwater enters the system through infiltration/inflow. To lessen the potential for sanitary sewer overflows which may result in discharges to wetland resource areas (or back-ups in residential basements), a capacity analysis of the wastewater transport system should be conducted and appropriate mitigation undertaken, whether it be storage of sanitary sewage during flooding events, new or replacement sewers, or removal of inflow.

F. Exterior Lighting

All street lights, exterior lighting, and lighting for parking areas should be minimized, timed, and directed downward so as not to shine into vegetation and wetland resource areas. The developer should adopt “Dark Sky” and LEED standards in their bid documents such measures will be protective of habitat (nocturnal migratory birds).

G. Sidewalks to the Alewife T Station

The layout of the proposed sidewalk is directly through a wetland, the one that is contained in the old sawmill foundation. This should not be allowed. Pedestrians can instead use the street and its sidewalk and leave the wetland and AURA undisturbed.

H. Direct Access to Route 2

Overall Site Plan C-2.0 shows a proposed on and off ramp to Rt 2. This site plan is marked with “Proposed Lake St. off ramp driveway access,” which shows an access road directly off and onto Route 2 westbound, but it is not discussed in the project narrative. This possible access road appears to go through wetland resource areas and it is unlikely to be approved if it goes through BVW or isolated wetland.

5. Conclusion

Many years of neglect, misuse, abuse, and the increasing development pressures in the adjacent urban areas have impacted this property to its detriment. To preserve the resource area functions and mitigate potential harm to those functions, the Arlington Conservation Commission respectfully requests that the ZBA:

- require the Applicant to provide the information specified above so that the impacts on wetlands and other natural resources can be evaluated;
- not grant any waivers from the Town of Arlington Wetlands Protection Bylaw and implementing regulations;

- direct the Applicant to apply for Conservation Commission approval of both (i) the boundaries of wetland resource areas and (ii) any proposed work in and near those areas;
- require the Applicant to provide stormwater information; and
- require peer review of the wetland delineation, floodplain delineation, compensatory flood storage, stormwater information, and calculations.

We hope the ZBA finds the above comments and information helpful. Please contact us should you have questions. ACC members plan on attending the ZBA's hearings on the Application, the next of which we understand to be scheduled for July 14, 2020.

Very truly yours,

Susan Chapnick, Chair
Arlington Conservation Commission

Enclosed:

1. 2015 Arlington Regulations for Wetlands Protection (43 pages).
2. Abbreviated Notice of Resource Area Delineation for Mugar Parcel, Arlington, Massachusetts, prepared by Rizzo Associates, Inc., dated July 11, 2000 (9 pages).
3. Abbreviated Notice of Resource Area Delineation Plan for Mugar Parcel, Arlington MA, Sheet No. A-1, prepared by Rizzo Associates, Inc., dated 05/18/2000, revised 10/18/2000 (6 pages).

August 05, 2020

Jenny Raitt, Director, Department of Planning and Community Development

Arlington Town Counsel
50 Pleasant Street
Arlington, MA 02476

**Re: Thorndike Place - Arlington, MA
Comprehensive Permit Civil / Site Peer Review**

Dear Ms. Raitt:

BETA Group, Inc. (BETA) has completed its peer review of the environmental, civil and stormwater related elements of the site plans and supporting engineering documents for the above-referenced project, based on the following materials:

- *Thorndike Place Comprehensive Permit* stamped plan set, Dorothy Road, Arlington MA, 12 sheets, dated March 13, 2020 prepared by BCS Group;
- *Oak Tree Development, Thorndike Place* plan set, Dorothy Road, Arlington MA, dated February 24, 2015 prepared by Borrego Solar;
- *Notice of Eligibility for 40B Site Eligibility Letter*, "Thorndike Place" off Dorothy Road, (Mugar Site) Arlington, MA, peer review letter prepared by Nover-Armstrong Associates, dated August 10, 2015;
- Memorandum, *Completeness Review of Comprehensive Permit Application*, prepared by Jonathan Witten, Esq., KP Law, acting as special municipal counsel, dated September 26, 2016, updated July 7, 2020;
- *Response to Completeness Review Memo*, Thorndike Place, Dorothy Road, Arlington MA, dated March 18, 2020 prepared by Smolak & Vaughn LLP;
- Comment letter, Thorndike Place, prepared by Arlington Land Trust, dated July 3, 2020;
- Comment letter, Thorndike Place, prepared by Arlington Redevelopment Board, dated July 3, 2020;
- Comment email, Thorndike Place, prepared by Arlington Transportation Advisory Committee (TAC), dated June 18, 2020;
- Comment letter, Thorndike Place, prepared by Arlington Select Board, dated July 7, 2020;
- Comment letter, Thorndike Place, prepared by Arlington resident Cori Beckwith, dated July 7, 2020;
- Comment letter, Thorndike Place, prepared by Arlington Open Space Committee, dated July 6, 2020;
- Comment letter, Thorndike Place, prepared by Arlington Inspectional Services Dept, dated July 3, 2020;
- FEMA Flood Insurance Study, Middlesex County, Revised June 6, 2016;
- Town of Arlington Zoning Bylaw with amendments through April 2016;
- Town of Arlington Wetland Protection Bylaw, Article 8 and Regulations for Wetland Protection, June 4, 2015;
- MassDEP Stormwater Management Standards (SMS);

- Massachusetts GIS mapping tool OLIVER (http://maps.massgis.state.ma.us/map_ol/oliver.php), website visited July 20, 2020;
- USFWS Information for Planning and Consultation (IPaC), online tool (<https://ecos.fws.gov/ipac/>), website visited July 20, 2020.

The following are our comments on the plans and supporting documents.

General

BETA Group was retained to perform a civil / site / stormwater design peer review of the Comprehensive Permit application for the proposed Thorndike Place 40B housing project. Part of this review includes an overall analysis of the existing site to confirm its suitability for the proposed project. At this preliminary design phase, it is understood that the proposed site utilities such as the stormwater management system have not been fully designed and are shown graphically with some initial calculations generated to use for general sizing purposes. An in-depth review of hydrologic models for the project site would be undertaken later when the site design is at a more advanced phase.

Existing Conditions

The project site includes multiple parcels that total approximately 17.7-acres of land located between Dorothy Road, Burch Street, and the Concord Turnpike (Route 2) in Arlington, Mass. Dorothy Road and Burch Street are both residential neighborhood streets featuring predominantly single-family houses. The site is essentially undeveloped woodland area that has been a location for the dumping of earthen fill and assorted debris throughout the years. Site topography generally slopes southerly towards the Concord Turnpike.

A review of the current FEMA Flood Insurance Study for Middlesex County indicates that a majority of the site is located within the mapped 100-year flood plain Zone AE (Elev. 6.8) and that almost all of the site is located within the 500-year flood plain Zone X.

Proposed Project

The proposed project includes the construction of a 207-unit residential apartment building and 12 townhome style building units along with associated access driveways, parking areas, utilities, infrastructure, and stormwater management system.

2015 Comprehensive Permit Application

A Comprehensive Permit Application was originally submitted for the proposed Thorndike Place project by the Applicant in 2015. Nover-Armstrong Associates (N-A) conducted a detailed peer review of the application package and issued a peer review letter dated August 10, 2015. Their review letter contained eighteen (18) comments regarding the site plans and application package. The following comments from the 2015 N-A review letter related to civil/site design remain applicable:

2. The Application does not comply with the Required Attachments Relating to Section 3.0 Preliminary Site Layout Plan(s).

- a. Proposed site grading (2' contours) are not shown.*
- b. Proposed utilities (stormwater Best Management Practices and conveyances) are not shown.*

Recommendation: The proposed Grading and Drainage plans now show spot grades throughout the proposed parking and access drive areas with 1-ft contours shown in the flood-plain compensatory storage areas and linear water quality basins along the northerly site perimeter.

No proposed grading is shown along the westerly limits of the parking/driveway area to match into existing conditions.

Proposed sewer, water and stormwater utilities are shown schematically on the Utility Plan sheets. No proposed gas, electrical or tele/com services are currently shown.

15. Eight boring locations are shown on the Existing Conditions Plan C-1 with surface elevations and depths to groundwater noted. Dated and detailed boring logs are not provided on the plans or in the Application making it difficult to evaluate whether the depth of the groundwater observed represents the seasonal high groundwater elevation. The depth to groundwater is presumed to have been measured the day the borings were advanced and may not represent the actual high ground water elevation.

16. Excavated test holes witnessed by a MassDEP Soil Evaluator are necessary to definitively identify the Site's soil types and whether the conceptual project design is generally appropriate for the Site. Boring logs document encountered type soils on the Project Site which help evaluate what types of BMPs would be feasible for the stormwater management system.

Recommendation: The results of any soil borings or test pits done on the project site should be submitted for review. Determination of the seasonal high groundwater elevation is necessary to confirm that the proposed stormwater BMPs are suitable as shown.

2020 Comprehensive Permit Application

The following are new comments based on our review of the revised Comprehensive Permit submittal from March 2020:

SITE PLANS

1. There is no emergency access drive shown around the rear of the main site building.

Recommendation: The Applicant must coordinate with the Arlington Fire Department to determine if an emergency access drive is required around the rear of the main site building.

2. The northerly corner of the proposed parking lot on the west side of the project site adjacent to #29 Littlejohn Street is located approximately 7-feet from the property line. The proposed spot grade at this corner is elev. 12, which is 3+ feet higher than existing grade.

Recommendation: The Applicant should provide proposed grading around the north side of the parking lot to demonstrate that surface runoff from this area will not be directed onto the property at #29 Littlejohn Street.

3. Areas of pervious pavement are proposed in the parking lots on the northeast side of the main site building and on the west end of the project.

Recommendation: The Applicant should provide a detail of the pervious pavement section for review to evaluate its functionality.

4. Areas for trash collection and snow storage are not identified on the site plan.

Recommendation: The Applicant should identify potential areas for trash collection and snow storage on the site plan to confirm that these will not conflict with other site elements.

5. A hay bale / silt fence detail is included on the detail sheet, but no erosion controls are shown on the site plans.

Recommendation: An erosion control limit should be shown on the site plans for review.

6. Standard details including catch basins, manholes, tree filter boxes, utility trench, etc. should be added to the site plans.

FLOOD PLAIN

7. A considerable portion of the proposed project design requires filling within the 100-year flood plain. Compensatory storage is required on a 1:1 (per foot) basis by the Mass Wetlands Protection Act (310 CMR 10.57) and on a 2:1 basis by the Arlington Wetlands Bylaw.

Recommendation: The Applicant should submit compensatory flood storage calculations on a foot per foot basis demonstrating compliance with the Local and State requirements.

8. The Applicant has identified three main areas for compensatory flood storage onsite; one along the south side of the main site building, one off the eastern end of the main site building adjacent to Burch Street and a third area within a linear water quality BMP located along the northerly and easterly property lines behind the existing houses.

The two proposed flood storage areas along the northerly/easterly property lines and east of the site building do not appear feasible as they require “balancing structures” (pipe culverts) to connect with the existing flood-plain to the south. Per 310 CMR 10.57 (4)(a), compensatory storage must have an unrestricted hydraulic connection to the flood-plain.

In addition, the linear BMP along the northerly/easterly property lines is labeled “Floodplain Compensation, Water Quality/Detention Area”. If this linear BMP receives surface runoff from the project site, there will likely be no storage volume available for compensatory flood storage.

Recommendation: The Applicant must demonstrate that the proposed compensatory storage is both feasible and in compliance with the appropriate regulations.

STORMWATER MANAGEMENT

9. The Applicant has not yet submitted any stormwater runoff calculations or analysis for review. Without the stormwater calculations, it is not possible to determine if the project as currently proposed can comply with the MassDEP Stormwater Management regulations.

10. The main site building roof is proposed for stormwater detention. No details have been provided for how the roof detention will function or where the stormwater will discharge to.
11. The 12 proposed townhome units along Dorothy Road show garages under the buildings similar to the existing homes in the Dorothy Road neighborhood. The driveway entrances to the garages are generally two to three feet below the existing street grade, and drywells are shown in the driveways presumably for drainage purposes.
Recommendation: The Applicant should submit test pit data identifying the existing soils and seasonal high groundwater elevation in the area of the proposed drywells to confirm the drywells will function as intended.
12. A subsurface infiltration basin is proposed along the northwest corner of the main site building. No details have been provided regarding type, size, etc. Additionally, groundwater and soils information are required to confirm the feasibility of the design.
13. The Existing Conditions survey shows an existing DMH located at the corner of Dorothy Road in front of the proposed East site entrance. A 12" RCP is shown exiting the DMH and pointing west into the project site. Has the discharge point of the westerly pipe been identified?

UTILITIES

14. The Utility Plans show the proposed sewer/water/drainage utilities schematically with no sizes, material, or elevations. Also, the symbols used for the proposed catch basins and drywells on the site plans are not included in the Legend on Sheet G 101.

Recommendation: We recommend the Applicant coordinate with the Arlington Public Works Department regarding all proposed site utility connections to the public utilities in Dorothy Road and Burch Street to confirm that the connections are appropriate and comply with Town of Arlington construction standards. In addition, the symbols used for the proposed CBs and DWs should be added to the Legend.

15. The Utility Plans show an existing onsite sewer line and easement located along the easterly/northerly property lines from Edith Street to Little John Street and then continuing westerly across the site. The proposed project sewer services do not connect to this onsite sewer line at any location.

Recommendation: The Applicant should identify the owner and note the disposition of this existing sewer and easement in relation to the proposed project.

CONSTRUCTION

16. The proposed project as currently shown appears to require import of a significant amount of fill during construction. The adjacent neighborhoods are thickly settled with narrow streets and on-street parking which may present challenges for large construction vehicles traveling to/from the project site.

Recommendation: We recommend the Applicant provide a preliminary/draft Construction Management Plan that would identify anticipated number of truck trips, potential truck routes, onsite staging and material laydown areas, hours of operation, etc.

ENVIRONMENTAL

17. The site contains several resource areas Subject to Protection under the Massachusetts Wetlands Protection Act, M.G.L. Chapter 131, Section 40 (WPA), M.G.L. Chapter 21, Section 26-53 (the Massachusetts Clean Waters Act), and the Town of Arlington Wetlands Protection Bylaw, Article 8 (the Bylaw), including Land Subject to Flooding, Isolated and Bordering Vegetated Wetlands, and Adjacent Upland Resource Areas (AURA). Forested and scrub-shrub wetlands were observed throughout the southern half of the site, some of which present physical characteristics of potential vernal pool habitat. BETA found the vegetated wetland boundaries shown on the plans flagged in the field for three Bordering Vegetated Wetlands (BVW) Series A, B, and C, and one Isolated Vegetated Wetland (IVW), Series D, under the WPA and the Bylaw. The IVW D Series is not Subject to Protection under the WPA however it is protected by the Bylaw¹. The AURA is measured 100 feet horizontally lateral from the boundary of Resources Areas and is significant to the interest of the Bylaw² and is found to provide several functions and values significant to Bylaw including wildlife habitat. Section 25 of the Bylaw defines two levels of protection within the AURA, a No Disturbance Zone measured 25-feet horizontally from the resource area and a Restricted Zone measured 75-feet horizontally from the No Disturbed Zone.

Recommendation: The Bylaw applies the AURA to all wetlands including isolated wetlands to ensure protection of the interests identified in Section 1 of the Bylaw³. A field evaluation of AURAs function and values should be conducted to determine the areas significance to the interests identified in the Bylaw. Flagging the AURA boundaries in the field would provide a clear demarcation of these protected boundaries.

18. Plan Sheet C-100, "Existing Environmental Resources" dated March 13, 2020, of the ZBA filing shows two wetland boundary lines for each wetland series, a 2000 delineation line from an Abbreviated Notice of Resource Area Delineation dated May 1, 2000 and the current delineation conducted by the BSC Group, Inc. on January 15, 2020.

¹ In accordance with Section 21, B (1) of the Town of Arlington Wetland Protection Regulations Bylaw, vegetated wetlands are freshwater wetlands, including both bordering vegetated wetlands and isolated vegetated wetlands which do not border on any permanent water body.

² The Arlington Bylaw defines AURA as the area 100 feet horizontally lateral from the boundary of any of the following Resource Areas: marsh, freshwater wetland, vernal pool, wet meadow, bog, swamp, bank, stream, creek, pond, reservoir, or lake, or resource area defined in Section 2.A(1) through (4) of the Bylaw.

³ Section 1, B of the Bylaw states "areas subject to protection under the Bylaw are to be regulated in order to ensure the protection of the following interests: public or private water supply, ground water supply, flood control, erosion control and sedimentation control, storm damage prevention, other water damage prevention, prevention of pollution, protection of surrounding land and other homes or buildings, wildlife protection, plant or wildlife habitat, aquatic species and their habitats, and the natural character or recreational values of the wetland resources (collectively, "Resource Area Values" or "Interests of the Bylaw").

Recommendation: Field data describing the methodology, soil, vegetation, and hydrology should be provided in the ZBA filing. It appears that the resource area boundaries were delineated during the non-growing season. Therefore, additional vegetative data may need to be collected by the Applicant to support their boundary delineation conducted in January 2020. Upon receipt of the supporting field data, BETA would be able to confirm existing resource area boundaries upon submission of this information.

19. The Layout, Materials, and Landscape Plan show impacts to the IVW, D Series, and associated AURA as a result of a proposed boardwalk that bisects the wetland. Isolated wetlands are significant to the interest of the Bylaw and provide equal functions and values as those of BVWs (Section 21 A). The Bylaw requires replication of wetland impacts at a 2:1 ratio and a detailed Replication Design that incorporates the MA Inland Wetland Replication Guidelines to the extent practicable and/or restoration of a degraded wetland⁴. The Bylaw provides additional protection within the AURA zones associated with all wetlands regardless of bordering or isolated (Section 25). The current Plans do not provide the extent of impacts to the IVW or required replication. Under the Bylaw, IVWs are significant to the interests identified in Section 21⁵ and are further protected by the highly regulated AURA.

Recommendation: Waiver of the Bylaw would result in a loss of resource areas (IVW and AURA) and associated wildlife habitat. The applicant should provide the ZBA with an evaluation of the functions and values provided by the IVW and AURA before considering the Waiver Request.

20. Under Section 25,C of the Bylaw the 25-foot No Disturbance Zone of the AURA is highly restrictive and should remain unchanged from its pre-project conditions. All areas within the AURA are significant to the protection of wetland characteristics and values and the Applicant will need to prove that reasonable alternatives for work within the Restrictive Zone are not available.

Recommendation: Based on Section 25, D of the Bylaw, the Applicant should provide the ZBA an alternatives analysis that confirms no alternatives to working in the Restrictive Zone are available in support of the Bylaw Waiver Request.

21. An increase in the volume of stormwater runoff from the Project could exacerbate flooding on the Site and adjacent streets. Section 23 of the Bylaw requires flood storage compensation ratio of 2:1⁶⁷.

⁴ Section 21, E, (2) (c) states "The area of the wetland replication shall be at a 2:1 ratio to that area of wetland loss."

⁵ According to Section 21, A (1) Vegetated wetlands are likely to be significant to wildlife, to plant or wildlife habitat, to public or private water supply, to groundwater supply, to flood control, to storm damage prevention, to prevention of pollution, and to the protection of fisheries.

⁶ In accordance with Section 23, C of the Town Bylaw No activity, other than the maintenance of an already existing structure, which will result in the building within or upon, or removing, filling, dredging or altering of, land subject to flooding shall be conducted without written permission of the Conservation Commission. And

⁷ Section 23, D states the Commission may permit activity on land subject to flooding shall provide compensatory flood storage for all flood storage volume that will be lost at each elevation...at a 2:1 ratio minimum, for each unit volume of flood storage lost at each elevation.

Recommendation: Currently the Bylaw protects against exacerbating current flooding issues as well as potential future flooding as a result of climate change that current FEMA base flood elevation may not address. The Bylaw requirement of 2:1 compensation would protect against flood damage of adjacent property and infrastructure. BETA recommends that the Applicant address BETA comments x, x, etc. (add the #'s) prior to considering the Bylaw Waiver Request.

22. BETA assumes vegetation removal will be required for construction of the Project within resources protected under the WPA and Bylaw including AURAs and buffer zones that is assumed to be significant to the interests of the Bylaw⁸. The Plan provides general site landscaping but does not include information on vegetation removal or replacement within protected areas.

Recommendation: The Applicant has not provided sufficient information to describe the site, the work or the effects of the work on the interests protected by the vegetated areas Subject to Protection under the Bylaw or state WPA. The Applicant should provide the specific criteria for removing vegetation and replacement strategies outlined in Section 24 - Vegetation, B through H, of the Bylaw that may otherwise be eliminated if the Bylaw is waived.

23. Based on the Project Plans construction is proposed within the AURA Zones. Work within the 25-foot No Disturbance Zone includes construction of a boardwalk and footpaths while large portions of buildings and facilities are proposed within the 75-foot Restricted Zone. Construction details and information describing impacts to the AURA zones have not been provided and a thorough review of the Project impacts and implications to the interest of the Bylaw and WPA cannot be completed at this time. The Bylaw allows only passive passage within the No Disturbance Zone and designates areas of suitable levels of disturbance within the Restricted Zone.

Recommendation: The Bylaw provides additional levels of protection to areas adjacent to resources that is not provided in the WPA. The Applicant has not provided sufficient information for the ZBA to make an informed decision to waive the Bylaw. BETA recommends the Applicant provide detailed construction plans, grading plans associated with buildings, parking lots, gazebo, and footpaths, erosion control plan, impact calculations of resource areas under the interest of the Bylaw and WPA, mitigation description and plans, and a narrative detailing proposed activities.

24. The southern corner of the site is located within a FEMA Floodway. The plans show portions of the proposed footpath through the Floodway and if work in the area includes clearing and/or grading consultation with FEMA will be required.
25. Review of the USFWS, Information for Planning and Consultation (IPaC), identified 18 migratory bird species and the threatened northern long-eared bat (NLEB; *Myotis septentrionalis*) that have the potential to occur within the site and surrounding area. An official USFWS site review and species list has not been generated at this time. The site is densely vegetated and provides wildlife habitat value for urban species such as common resident birds, racoons, fox, squirrels, chipmunks, skunk, opossum,

⁸In accordance with Section 24 A vegetation within resource areas is significant to the protection of wildlife, wildlife habitat, and water quality.

deer, and rabbit to name a few. Wildlife habitat is significant to the interest of the Bylaw⁹ and vegetated resource areas, including isolated wetlands, are protected by buffers of the AURA zones. Construction activities that may alter vegetated resource areas are assumed to affect wildlife habitat and breeding which is prohibited under the Bylaw¹⁰.

Recommendation: The Applicant should conduct a wildlife habitat evaluation of the vegetated 17.7-acre site by qualified professionals. A wildlife habitat evaluation and assessment of resource areas will provide a better understanding of the potential loss of habitat within isolated wetlands and AURA zones if the Bylaw is waived.

26. Based on the Application the Project appears to be in the preliminary development stage and impact details of environmental interests identified in the Bylaw and its Regulations are not defined at this time. Specific details such as calculations of impacts to resource areas, impacts within buffers of AURA, locations of temporary impacts such as staging areas, haul roads, erosion controls, and dewatering will need to be provided to adequately evaluate how the Project activities will affect areas protected under the WPA and The Arlington Wetlands Regulations.

Conclusions

At this preliminary design phase, the Applicant has not provided sufficient detail regarding the disposition of site-generated stormwater runoff to determine that the proposed project is able to satisfy MassDEP Stormwater Management Regulations. The proposed stormwater management approach appears to utilize areas of pervious pavement, rooftop detention and linear treatment BMPs to mitigate the impacts from the proposed site development. Absent the review of stormwater calculations, it is not possible to determine if the requisite peak rate/volume mitigation and water quality requirements have been provided.

The project design includes compensatory flood storage to offset proposed filling within the 100-year floodplain. The volume of compensatory storage cannot be verified because calculations have not been provided. Additionally, it appears that some of the areas proposed for compensatory storage may not be consistent with the required Local and State performance standards.

The proposed site grading plans appears to demonstrate that the proposed surface grading of the site will allow it to drain properly; however, it cannot yet be determined that the surface stormwater runoff will be effectively managed.

The proposed utility layouts for sewer, water and drainage are shown schematically and appear feasible. Gas, electric and tele/com utility layouts are not shown and their location onsite in relation to the other proposed utilities is unknown. Additional information including pipe sizes, materials, and invert elevations

⁹ In accordance with Section 30 – Wildlife Habitat - Activities which alter the Wildlife Habitat of any Resource Area in a manner that is likely to impact the breeding success of wildlife are prohibited.

¹⁰ Section 30 – Wildlife Habitat Activities which alter the Wildlife Habitat of any Resource Area in a manner that is likely to impact the breeding success of wildlife are prohibited.

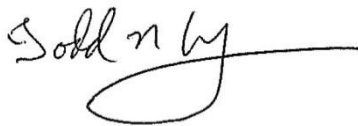
would need to be provided to verify compliance with Town construction standards and confirm that no conflicts exist between the various utilities.

The site includes several resource areas significant to the interest of the Arlington Wetland Protection Bylaw, Article 8 and Regulations for Wetland Protection (Bylaw) including Land Subject to Flooding, Isolated and Bordering Vegetated Wetlands, and AURAs. These resources provide important functions and values including flood storage and wildlife habitat that will be affected by the Project as it is currently proposed. The Bylaw provides additional protection to areas of significant value beyond that of the WPA, including IVWs, important vegetated zones adjacent to resource areas, and requires additional mitigation of impacts above that of the WPA. These additional requirements of the Bylaw ensure sufficient protection and compensation of resources significant to the interest of the Bylaw.

The application does not include sufficient information describing the site and resource areas, proposed work, or the effects of the work on the interests provided by the Bylaw. An evaluation of the resource areas function and values, wildlife habitat evaluation of the AURA as well as the IVW and its function in supporting wildlife habitat should be provided to the ZBA before considering Waiving the Bylaw.

If you have questions about any of these comments, please feel free to contact me at (401) 333-2382.

Very truly yours,
BETA Group, Inc.



Todd Undzis, P.E.
Project Manager



Marta Nover
Vice President

cc: Douglas W. Heim, Arlington Town Counsel